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# AUTOMOTIVE INDUSTRIES

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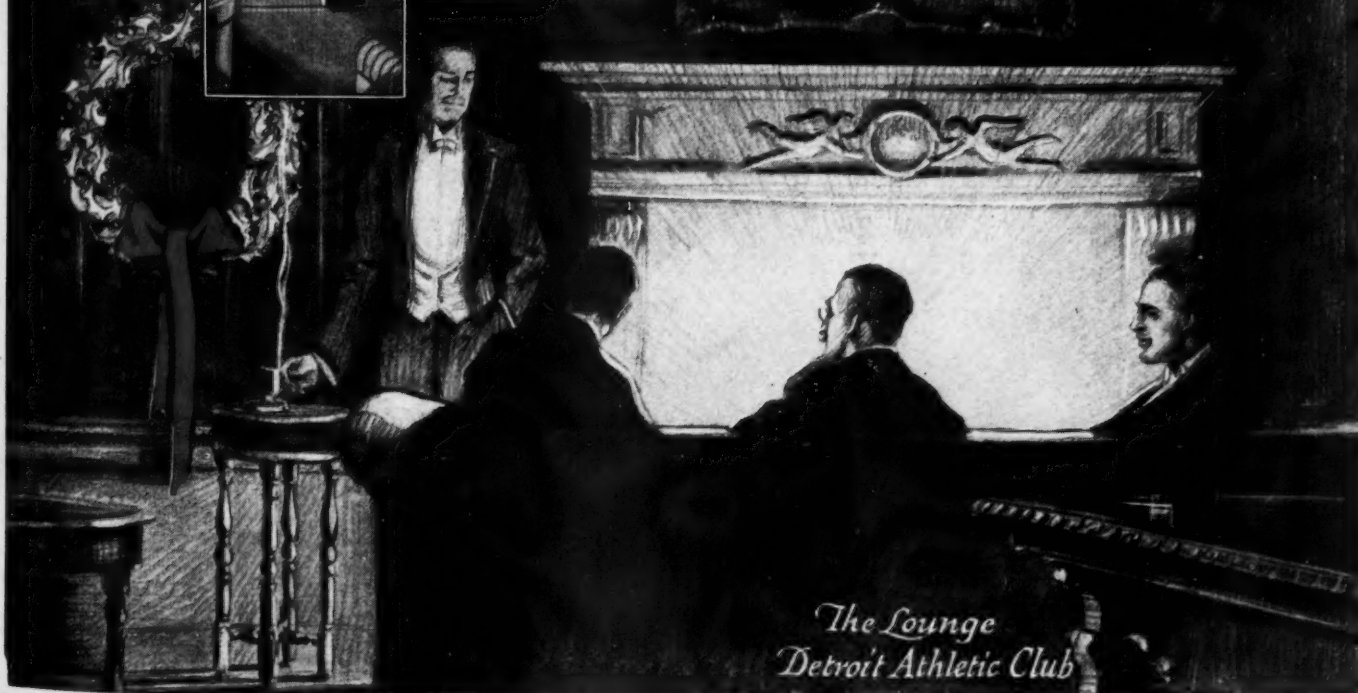


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# AUTOMOTIVE INDUSTRIES

## The AUTOMOBILE

VOL. XLIX

NEW YORK—THURSDAY, DECEMBER 20, 1923

No. 25

## Earnings of Improved Highways Far Exceed Their Cost

Motor Transport Seeking to Serve More Rapidly than Handicap of Inadequate Roads Is Being Removed. Traffic Represents Cross-Section of Community Life. Benefits All.

By Thomas H. MacDonald

Chief, U. S. Bureau of Public Roads

**O**THER nations have in times past built great road systems under military dictate, largely for purposes of conquest. The United States plans a system of highways to serve her people in the pursuit of economic freedom and happiness. As now visualized in the first real map of the major system of highways, the conception is truly national.

The task ahead is defined. It will be completed.

The present map includes 168,881 miles in the Federal aid system, about 30,000 miles less than the legal maximums based upon the certified total public road mileage in the United States of 2,886,061 miles. While there remain some details yet to be adjusted, they are in the main relatively unimportant and will not be allowed to cause controversy between the States and the Bureau.

The State and Federal Governments are financially able, and the State and Federal highway departments are administratively and technically competent to build the roads in the order of greatest importance in the different sections of the country.

As indicative of the task ahead, the combined mileage of State systems as of Jan. 1, 1922, is 220,000 miles. Of these, 80,200 miles are reported surfaced, or 36 per cent. The Federal aid system now approved is about 80 per cent of the total State highway mileage, and may be considered to this same extent coincident. Applying the same pro rata of improvement the first of the year 1922, about 30 per cent of the Federal aid system was surfaced, or about 50,000 miles. Of Federal aid highways on July 1, 1923,

there had been completed 26,536 miles, and there were under construction 14,771 miles, a total of 41,307 miles of all types. Of these, 8686 miles were graded and drained, and 32,621 miles surfaced. All but a very small percentage of this mileage is on the Federal aid system as now established and, although admittedly the above figure of 50,000 miles of surfaced roadways on this system is very rough, still it is apparent that the surfaced improvements added in the four-year period 1920-1923 have been equal to or greater than all the surfacing placed in all the prior years.

### Ten-Year Building Program

A careful study is being made, State by State, of the improvement status of this definite Federal aid system. If these estimates are found to be approximately correct, at the end of this year there will be about 60,000 miles of surfaced roadways and about 8700 miles graded. This leaves 110,000 miles to be surfaced. To surface this mileage in the ensuing decade, that is, by 1934, there must be an annual program of 11,000 miles of completed new construction. In addition, there must be the "stepping up" of many miles of lower to higher types, the reconstruction of surfaces built before the present traffic, and the widening of roadways to carry the increased traffic. During the ten-year period there will necessarily be added a considerable increment to the present approved mileage.

Nor does this yet represent the size of the essential construction program to bring this major system up to a satisfactory operating basis in the next ten years.

\*Address delivered before annual meeting of American Association of State Highway Officials at New Orleans.



There are many miles of the system crossing Indian reservations, National Parks, and National Forests in our western and southwestern empire. There are many new and important bridges required and a large program of bridge reconstruction, especially in the East and South. Added to all this is the ever-increasing need of safety improvements, such as the elimination of grade crossings.

### Situation Acute in West

These and similar problems are not to be indefinitely deferred. They must be met. From the standpoint of financing and construction the most acute situations exist in a number of the Western States. The extensive network of roads covering the Eastern and Mississippi Valley States, focusing in a few lines east and west across the Rocky Mountain system, the great central plateau, and the Sierra Nevada system, finally to meet and multiply into the highways of the Pacific Coast States. While limited in number, these in-between connecting links present serious problems, financial and engineering—not through an unbroken length, but at times for long distances, where there is little or no local development, where the physical obstacles to road construction are unusually difficult, or where these necessary links are not so located that they, at the same time, serve the most urgent highway service needs of the communities or the whole State.

The sliding scale of financial cooperation does not meet these conditions. It alleviates, but does not cure. The agricultural depression has hurried the acute status; it is not the cause. The Bureau understands this condition and is in sympathy with its proper solution. This right solution can and must be found. There can be more than one approach. A readjustment of the scale of cooperation to meet specific extraordinary conditions, the general development of more economical design or construction. With the existing status of construction, both as to types and extent, Federal participation in maintenance as a general policy is not the logical solution.

### Road Building Races with Traffic

The indicated necessary improvement program on the major highway system is large. It must be considered most seriously, but in the light of the amazing growth in highway traffic.

Economic data are becoming available by which we may measure the need for, and usefulness of, improved highways with certainty, and the conclusion is inevitable that the annual mileage of new roads is lagging behind the expansion of highway traffic. Highway transport is seeking to serve more rapidly than the handicap of inadequate highways is being removed.

The State Highway Department of California and the Bureau have made two traffic studies covering the State system, the first in 1920, the second in 1922. At the same 103 counting stations, the two-year numerical increase in daily traffic was 47 per cent, thus closely reflecting the 54 per cent increase in registrations.

The Baltimore milk transportation survey shows 36 per cent of the city's supply now brought in by motor truck. In 1919 only 18 per cent reached the city in this way.

The Connecticut highway transport survey developed beyond question the fact that the direct connections between population centers are the major traffic lines, that the traffic is reasonably proportional to the population concentration in the centers directly connected, and that the heavy traffic both in weight and number is

restricted to a relatively small percentage of the total mileage of public roads within the State.

### Registrations Increase Rapidly

The Bureau's predicted total registration for this year is 14,500,000, and for the following year 16,000,000 plus. The extension of freight and passenger lines is bringing rapidly to the individual highway transport service whether he is a car owner or not.

The report of Special Committee IV of the United States Chamber of Commerce on the "Relation of Highways and Motor Transport to other Transportation Agencies" states as one of its major conclusions:

"Trunk highways in any area should be able to carry the normal vehicular traffic of that area, and, if the traffic economically justifies the use of especially heavy trucks, highways with stronger sub-bases must be provided. This constitutes a problem requiring particular attention in the design or highway systems and in the regulation of traffic. In other respects present types of highways, present routes connecting principal centers of population and production, and the present trend in size, weight and speed restrictions of vehicles using highways show a rational system of highway development that should be continued."

Highway traffic presents a cross-section of the business and social life of the communities. Upon this fact and the definite traffic data now being gathered may be predicated the character, amount and weight of the traffic which the highways should be designed to carry.

### Expenditures Bring Benefits

There is a large discussion, much of it critical, of the expenditures for highway purposes. There is particular criticism directed against bonds to pay for the improvements. The tendency on the part of the uninformed and unthinking is to condemn expenditures for such purposes because they are, in and of themselves, large in amount. They forget that no one can pass upon the reasonableness and necessity of a public outlay of money without considering at the same time the utility and value which is brought to the use of the public because of such an expenditure.

It is just as logical to judge the soundness of a business concern by looking only at the liability side of its statement without comparing it with the asset side, as it is to criticize expenditures for highway construction without taking into account the value of the service which such highways render, i. e., their earning capacity. We have recognized for years the terrific annual loss of mud roads and the possible savings, direct and indirect, which accrue to the users of improved roads.

### Trucks Haul Milk

A milk truck taking the milk of a certain group of farmers to the Baltimore market had to operate over a 5-mile stretch of unimproved road to reach a surfaced road. The regular price of transporting milk is 3 cents per gallon. In this case the operator of the truck charges his farmer patrons  $\frac{1}{2}$  cent per gallon extra for the six-months period from October to April because of the bad road conditions. Those farmers are actually paying \$900 annually more than the regular charge, or \$180 per mile, or the interest at 5 per cent on \$3,600 per mile. This is the actual increased cost for milk alone. Considering the other traffic which exists, it would be good economy to borrow the money, if necessary, to improve that road. There is good reason to question the sincerity of these self-constituted "watch dogs" of public funds, who set in motion propaganda against highway



expenditures and are silent as to the net savings resulting from them.

In 1921 the Bureau made a thorough survey of all highway expenditures. The results are illuminating. Of the total, \$1,036,587,000, there was expended by or under the State highway departments \$413,241,662, or 40 per cent, while under local authorities there was expended \$623,346,110, or 60 per cent. These expenditures were divided as follows:

EXPENDITURES—1921

|                                                  |               |       |
|--------------------------------------------------|---------------|-------|
| By or under control of State Highway Departments |               |       |
| State and State-aid construction..               | \$291,973,813 | 70.7% |
| State and State-aid maintenance..                | 74,526,746    | 18 %  |
| Engineering and administration..                 | 18,881,855    | 4.6%  |
| All other items (a).....                         | 27,859,248    | 6.7%  |
| Total, States.....                               | \$413,241,662 | 39.9% |

(a) Includes payments of interest and principal of highway bonds, purchase of gravel pits, quarries, etc.

LOCAL EXPENDITURES—1921

|                                  |               |       |
|----------------------------------|---------------|-------|
| Construction, all classes.....   | \$334,991,560 | 53.7% |
| Maintenance .....                | 174,066,423   | 27.9% |
| Engineering and administration.. | 17,149,498    | 2.8%  |
| All other items (a).....         | 97,136,629    | 15.6% |

|                                    |               |       |
|------------------------------------|---------------|-------|
| Total, local.....                  | \$623,346,110 | 60.1% |
| Grand total expenditures, 1921.... | 1,036,587,772 | 100 % |

(a) Includes payments of interest and principal of highway bonds, purchase of gravel pits, quarries, etc.

Income Divided

Remembering that on the basis of a billion-dollar highway program the division is 40 per cent expended by the State and 60 per cent by the local authorities, note the division of income for all highway purposes.

TOTAL INCOME FOR ALL RURAL HIGHWAY PURPOSES—1921

|                                  |               |       |
|----------------------------------|---------------|-------|
| Bonds .....                      | \$438,109,273 | 38.1% |
| Taxes .....                      | 415,680,010   | 36.2% |
| Motor fees.....                  | 118,942,706   | 10.3% |
| Gas .....                        | 3,683,460     | .3%   |
| Federal aid and forest funds.... | *81,806,741   | 7.1%  |
| All others .....                 | 91,215,706    | 8. %  |

|                  |                 |        |
|------------------|-----------------|--------|
| Grand total..... | \$1,149,437,896 | 100. % |
|------------------|-----------------|--------|

\*From State reports.

Property taxes contribute direct 36 per cent. As closely as can be estimated, this is about ten or eleven per cent of the total annual tax bill, local, State and Federal.

Therefore, if there had been no highway program, State or local, property taxes would only have been reduced by, say, eleven per cent.

Examine now the division of income for State funds only.

INCOME TO STATE HIGHWAY FUNDS—1921

|                                               |               |       |
|-----------------------------------------------|---------------|-------|
| State bonds and special assessments .....     | \$114,825,637 | 28.3% |
| State taxes, direct.....                      | 46,206,583    | 11.4% |
| State appropriations from general funds ..... | 20,817,354    | 5.1%  |
| Funds from counties, etc.....                 | 29,302,653    | 7.2%  |
| Motor vehicle fees.....                       | 101,284,479   | 25.0% |
| Gas tax.....                                  | 3,273,988     | .8%   |
| Federal aid and forest funds....              | 81,806,741    | 20.2% |
| Miscellaneous sources.....                    | 8,020,964     | 2. %  |

\$405,538,399\*

\*There is an apparent discrepancy between State income and expenditure, but it should be remembered that in the conduct of public business, the two are ordinarily not exactly coincident or correlated. The discrepancy here is less than 2 per cent, a most excellent record.

Crediting general property tax with both State taxes and funds from counties, the total is 18.6 per cent. The items of Federal aid, forest funds, motor vehicle and gas tax, total 46 per cent, and State bonds 28.3, i. e., 74.3 per cent outside direct property taxes. The information is not available to divide the bond retirement and interest between property taxes and motor vehicle and gas taxes.

Tax Clamor Misdirected

This is the real truth. The local roads are the cause of property taxes for this purpose being higher. This clamor about taxes is directed at the wrong cause.

These figures are for 1921 and the increase in revenues from the motor vehicle and gas taxes are growing rapidly. The total 1921 revenues from this source, including Federal taxes, were more than \$350,000,000, equal to 85 per cent of the income to State highways. It exceeds the entire tax bill of the railroads.

The Federal Government has received in taxes on the motor vehicle and repair parts more than double its entire expenditure for Federal aid.

The greatest danger we face in completing the Federal aid system or the State systems are the drives against these funds for local roads, and even for purposes having not the most remote relation to highway improvement. The very life of the highway departments and major highway program depends upon these revenues.

This is the stern fight ahead. Property taxes can and should pay for the local program until the major one is complete, and if property taxes are too high the local program of new construction can be smaller for the time.

From this general discussion of the present situation, and from the experience in each State, the conclusion is certain that the improvement of the Federal aid highway system is the most important big task ahead, not because it is the Federal aid system, but because it comprises the most important interstate and intercounty highways of the nation—the very framework of the whole structure, and that with its improvement heavy traffic will more and more concentrate on it, thus relieving other roads.

But that, no matter how important this may be, there will be determined efforts to divert the necessary funds to roads of lesser traffic importance, but totaling a much larger aggregate mileage. Even though well begun, the big work of the State highway departments and the Bureau has only just begun. There must be established closer and more sympathetic understanding, and in this the Bureau desires to meet the States more than half way.

Licenses Should Pay for Repairs

Under the law the bureau cannot participate in the expense of maintenance. This expense ought to be met from the revenues from the motor vehicle license fees and the gasoline taxes imposed now by thirty-six States.

The public is impatient. It is demanding increased highway service, and this service can only be rendered by better maintenance, by as large an annual program of construction of roads suited to the needs as the funds will permit, by better construction, and by reducing costs.

These objectives can only be accomplished by more efficient administration and engineering, now made possible by the great advance in the science of highway engineering. Each State has its particular problems. If some States have larger available revenues, they, too, have the heaviest traffic problems. There are plenty of thorns with the roses in all the States.

# Eight New Speed Trucks Are Shown at British Exhibit

Designs are result of War Department offer to pay a subsidy for vehicles of this type. Flexible six-wheelers also prominent in commercial car show.

By M. W. Bourdon

**A**LTHOUGH the attendance at Olympia during the Truck Show, which opened on Nov. 22 and is still open at the moment of writing, has been insignificant as compared with that at the passenger car show, a large proportion of the exhibitors express satisfaction with the results so far. While the actual orders taken have been relatively few, encouragement is afforded by the number of genuine and promising inquiries, and it is believed that the truck industry has at last "turned the corner."

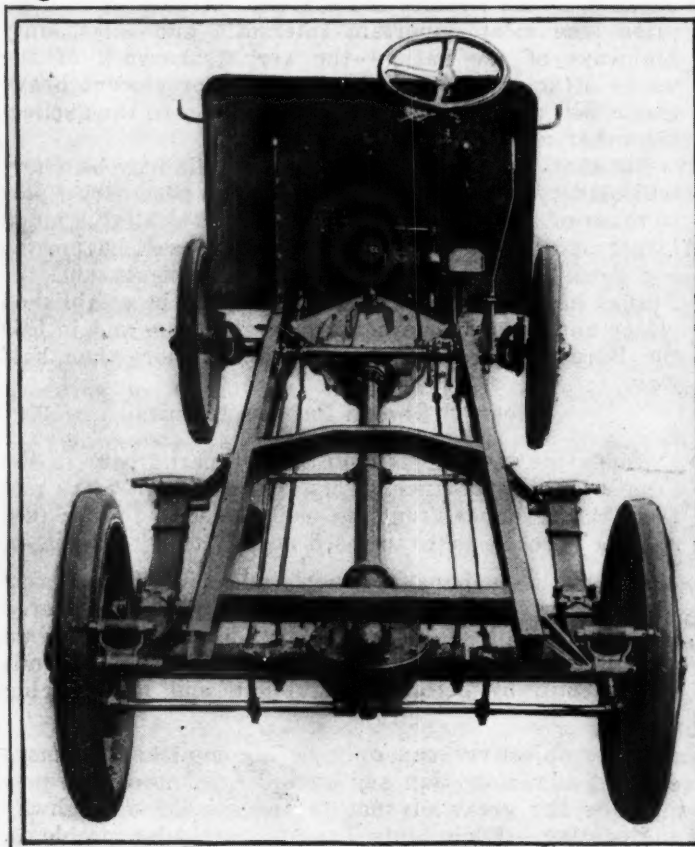
The show is larger and more international than any previous one. There are 320 vehicles on view on 88 stands, including bodywork exhibits, and there are also 140 accessory stands. Among the British makes are 26 of gasoline, 9 steam and 4 electric vehicles. American makes number 14, including those of Canadian production; in addition, there are 3 French, 2 Italian, 2 Swiss, 1 Belgian and 1 Danish. The American makes are Gray,

Buick, Chevrolet, G. M. C., Dodge, Graham, Yellow Cab, Durant, Reo, Garford, Overland, Traffic, F. W. D. and Gotfredson (G & J).

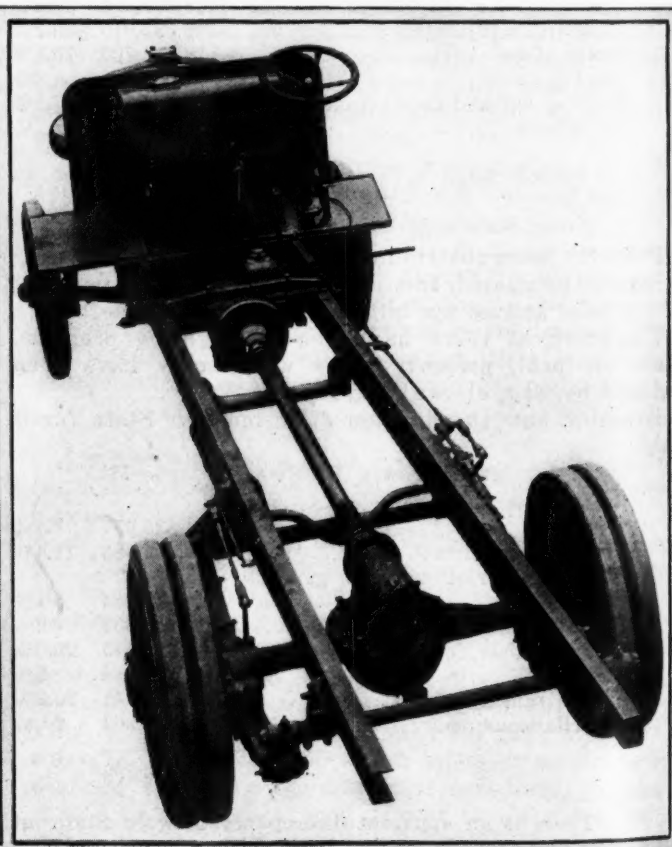
## Six-wheelers Prominent

Two outstanding features of the show are the first appearance of eight new British speed trucks for loads of from 2500-3800 lb., and the number of flexible six-wheelers having load capacities up to 15 (long) tons. The increase in the load capacity of four-wheelers noted in 1921 has not been maintained, for the six-wheeler (tractor and semi-trailer) has shown itself to be a more economical proposition for loads above 6 tons; only one British maker (Maudslay) shows a 7-tonner on four wheels.

The British speed trucks (for 3400-lb. loads) in six cases have been introduced as a result of the War Department's offer to pay a subsidy of £40 a year to users

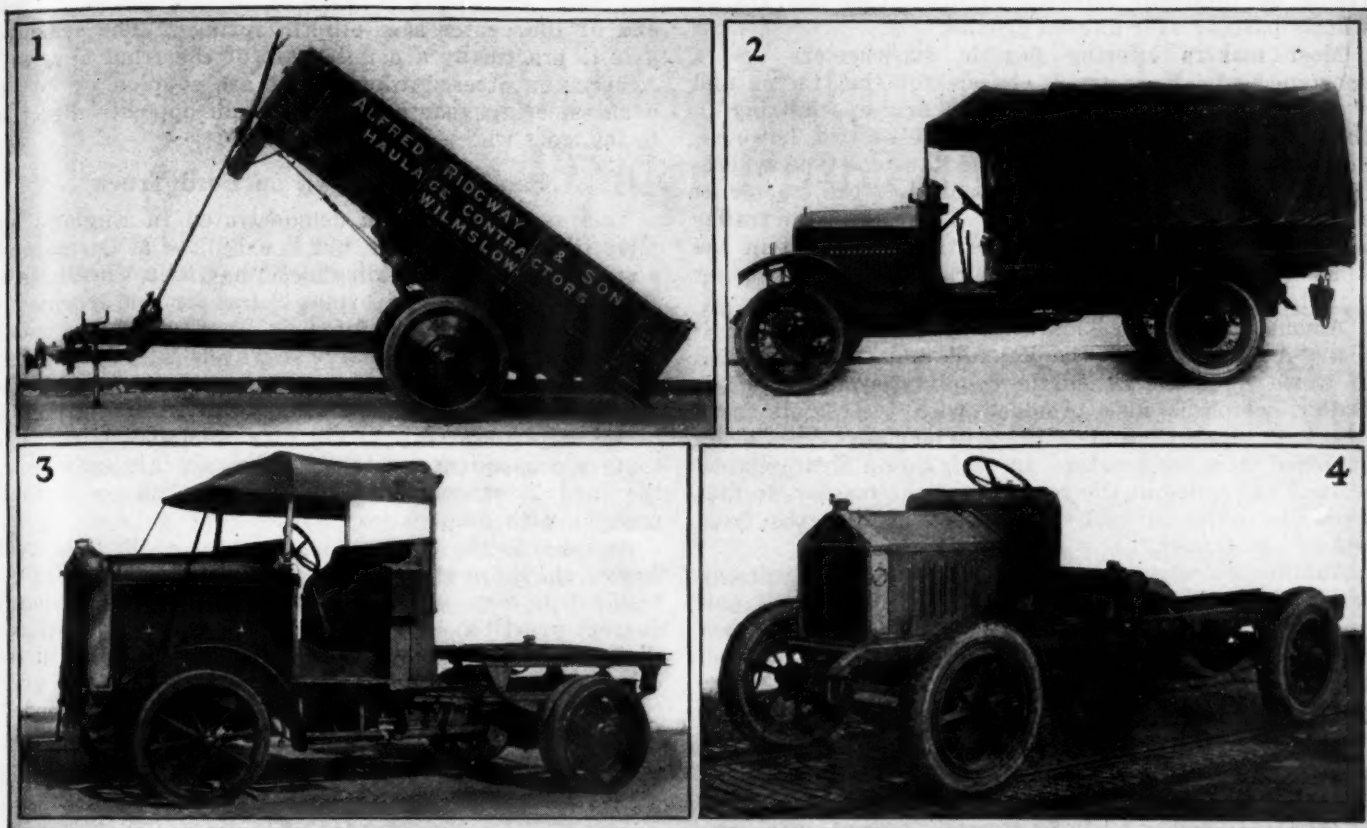


Rear view of new Dennis 2500-lb. truck chassis selling at £312 with pneumatic tires



New A. E. C. chassis for 5000-lb. loads





Four-ton semi-trailer for use with Fordson tractor, one-third of load to be carried on tractor wheels

New A. E. C. 10-ton tractor. Note that tractor frame at rear is suspended from turntable which itself is directly suspended from axle

Crossley 3500-lb. subsidy model. Body fitted is War Department type but is not essential on users' vehicles to secure subsidy

New Albion 3500-lb. chassis designed to secure to users the £40 annual subsidy of the British Government

of this type, provided the designs were approved and certain tests were passed. Two makers of these (Crossley and Talbot) have newly entered the truck side of the industry, while the others are well-known truck builders. The Government specifies pneumatic tires and a maximum chassis weight of 4000 lb. for these trucks.

Following are particulars of these six new models:

| Name     | Engine Dimensions | Wheel-base | Track  | Chassis Price |
|----------|-------------------|------------|--------|---------------|
| Albion   | 3½ x 5 in.        | 135 in.    | 61 in. | £595          |
| Crossley | 4½ x 5½ in.       | 140 in.    | 57 in. | £890          |
| Karrier  | 4 x 5 in.         | 132 in.    | 56 in. | £720          |
| Leyland  | 3½ x 5½ in.       | 126 in.    | 60 in. | £585          |
| Maudslay | 4 x 5 in.         | 132 in.    | 64 in. | £650          |
| Talbot   | 3½ x 5½ in.       | 126 in.    | 60 in. | £585          |

All have four cylinders, four speeds and worm drive.

In addition to the above are new 2500-lb. load models by Dennis and Star, neither of which is designed to secure the Government subsidy. On British standards the new Dennis is offered at a very low figure, viz., £295 with solid tires, and is likely to cut into the market which has hitherto been almost a monopoly of imported chassis; that, in fact, is the avowed object behind its introduction.

#### Dennis Has Successful Year

It has a four-cylinder 3.34 x 4.72-in. engine, unit power plant, cone clutch, three-speed gearset with central control, magneto ignition, splash and pressure lubrication, L-head cylinders, three-bearing crankshaft, pump circulation, helical pinion camshaft drive, electric lighting, inclosed propeller shaft, worm drive, semi-elliptic springs, internal brakes on rear wheels, and disc wheels.

The top gear ratio is 6.75 to 1, the chassis weighs 2600 lb., the wheelbase is 127½ in. and the track 56 in.

Dennis is one of the very few British truck makers able to show a profit during the past three years and has just reported a substantial increase for 1922-23, enabling a dividend of 13 per cent free of tax to be paid. The plant has a capacity of 40 chassis per week, which is as large as any purely truck plant in England.

#### Novel Features in A. E. C. Model

A notable new model at the show is a 2-tonner (net load, 5000 lb.) put forward by the Associated Equipment Company, the makers of 95 per cent of London's buses and of trucks and provincial bus chassis. The new model has a number of features departing from normal practice, the most prominent of which is the use of separate cast-iron liners for the cast-iron cylinder and crankcase unit. Then, too, it is the first British truck to have battery ignition.

Other details are 3.94 x 5.52-in. cylinders, four speeds, worm drive, thermo-syphon cooling, splash and pressure lubrication, solid tires on 36-in. disc wheels, 144-in. wheelbase and 61-in. track. The chassis price is £495 and the weight 5200 lb.

Another new A. E. C. production is a six-wheeled 10-ton tractor and trailer, which has a four-cylinder engine of 5¾ x 6¾-in., developing 65 b.h.p. at 1000 r.p.m. A special feature is that the turntable is supported directly by semi-elliptic springs on the tractor rear axle, while the rear end of the tractor chassis is suspended from the turntable by four double volute springs. This arrangement gives to the tractor equally good spring suspension whether the trailer be loaded or not and also relieves its

frame of torsional stresses arising from the trailer wheels passing over uneven ground.

Most makers offering flexible six-wheelers use a shortened wheelbase truck chassis for the tractor and a trailer and turntable made by a firm specializing in these (the "Carrimore" outfits). One or two, however, have adopted what is known as the Ransome type, wherein the two-wheeled trailer is attached to the tractor at a point midway between the two. This causes the trailer wheels and the rear ones of the tractor to run in the same track when turning a corner, the body being mounted on a turntable at each end.

Among the imported six-wheeled exhibits is the Belgian "Auto Traction," the Renault and the Latil. All of these have an automatic coupling system for the trailer, which is also provided with two small front wheels to support it and enable it to be manoeuvred when detached from the tractor. In each case a channel steel runway is formed at the rear end of the tractor, so that when the latter is backed into place it lifts the front end of the trailer.

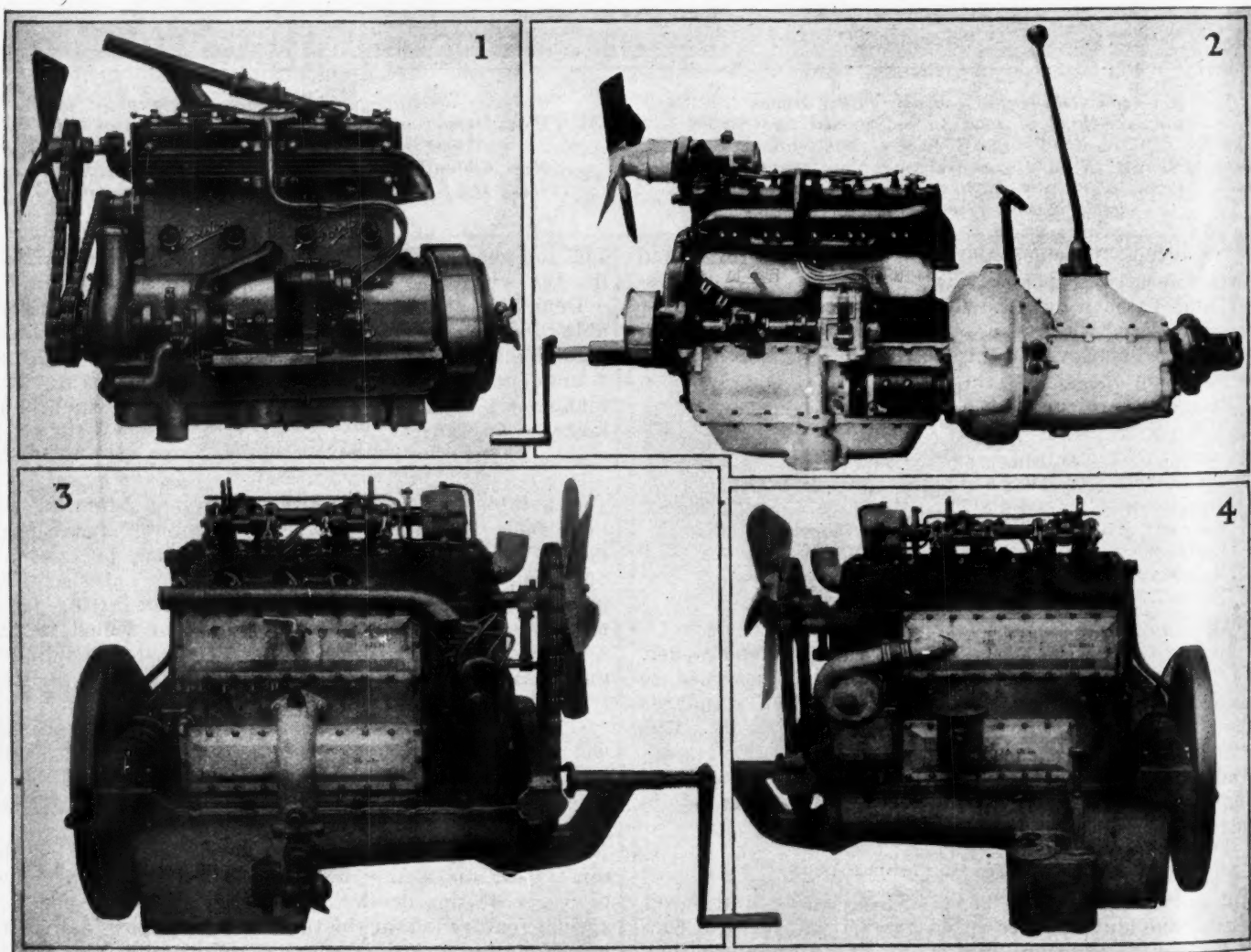
Another six-wheeler on new lines is a Danish design known as the Triangle Longframe. This is a single unit in which the frame is continued considerably rearward of the central axle and is supported by the rearmost wheels through the medium of channel steel members which run from the rear axle to trunnion bearings on

the frame and thence forward to the shackles at the rear end of the center semi-elliptic springs. The rearmost axle is practically a counterpart of the front one, with Ackermann steered wheels that are coupled up to the usual steering gear and move in an opposite direction to the front wheels.

#### Semi-trailer Shown on Ford Truck

This system has been demonstrated in England applied to a Ford 1-tonner, but is exhibited at Olympia on a specially designed 4-ton chassis having a wheelbase of 22 ft. (11 ft. x 2). Important claims for this scheme are that the weight distribution is unaffected by loading irregularities, for the rearmost wheels will never carry more than half that applied to the central pair; that the vertical movement of the frame behind the driver is never more than 50 per cent of a road inequality; and that, in consequence, with solid tires on this six-wheeler the load is subjected to less shock than on a four-wheeler with pneumatics.

As regards the engineering features of British truck design, the lapse of two years since the last show has not resulted in any striking divergencies from previously current practice. Beyond the points already mentioned the only notable development is in connection with the driver's position. Nine makers have adopted the over-type or side control arrangement on one or more models.



1—40-45 hp. engine of Crossley subsidy truck. 2—Powerplant of new Dennis 2500-lb. truck. Note position of generator and its belt drive. 3 and 4—Two views of the engine of the new Leyland subsidy model truck. It has an overhead camshaft driven by triple eccentric rods. Cylinder dimensions are  $3\frac{1}{2}$  by  $5\frac{1}{2}$  in. and there are only two main crankshaft bearings



## Manufacturers Striving Earnestly to Help Solve Dealer Problems

**M**ANUFACTURER-DEALER relationships never were more important in the automotive industry than they are today. This fact is recognized at the factories and most producers are giving anxious thought to the problems of their retailers. It is admitted that the margin of profit for most dealers is too small because of several factors, chief of which are the used car and territorial limitations.

Almost without exception company executives are attempting to devise constructive remedies for these evils. One after another they are conceding that the factory is directly concerned with the used car question and the trend is away from sharp territorial restrictions. Several companies are considering seriously the advisability of longer dealer discounts.

Altogether, manufacturers are displaying a greater degree of sympathy for their dealers than they ever have. This interest may be more or less selfish, because there are not enough dealers of the right type to supply the needs of the country, but it is none the less sincere.

Under these circumstances it is difficult to comprehend the motive which prompted the National Automobile Dealers Association to send out "a message to dealers and prospective dealers" advising them to stay out of the business or get out of it unless they can represent one of the "ten or fifteen" most successful lines.

"The automobile industry is today over-populated with dealers and manufacturers," says the circular. "There are only about ten or fifteen lines moving in the average sizable community out of which a dealer could possibly hope to make a profit, yet virtually every city in the country has from twenty to sixty lines represented. Because some of these lines have earned large amounts for dealer and factory, the public has generally believed that anyone could make enormous profits with any line of automobiles and, as a consequence, the unwise have scored heavy losses attempting to break into the industry."

The two most obvious reasons why this argument is fallacious are:

1. There are considerably more than ten or fifteen lines which can be made profitable by dealers.
2. Not all the companies selling the most cars are returning the largest profits for their dealers.

There are none too many sane, substantial business men engaged in the retailing of motor vehicles and there never will be. Much has been said and written of a "survival of the fittest" in the manufacturing end of the industry, and the same economic laws apply to the sales field.

Substantial profits are to be made in the selling of automobiles. If a dealer finds he isn't making money on the line he is handling, the first thing for him to do is to give himself a searching analysis to see if the fault is his own. If he can arrive, honestly, at the conclusion that it isn't, the next thing for him to do is to find another line on which he can make money. There's no reason why he should go out of the business.

This applies just as much to newcomers as it does to old-timers. The chances of success for the man who enters the trade from some other line are just as bright as they would be if he jumped from a familiar field into any other which was not familiar. If he has a reasonable amount of capital and plenty of sound business sense he can succeed.

In advising actual or prospective dealers to study the sales possibilities of the lines they handle or intend to handle, the N. A. D. A. circular naively says:

"A dealer can make sure of the product he is handling or intends to handle by demanding the facts in connection with the merchandising of that product at all its principal distribution centers. He can demand to know who are the dealers handling that car in the principal merchandising centers, he can demand to know how long these dealers have handled this car, he can demand to know if the car is among the ten or fifteen best sellers in the majority of the points in which it is distributed, he can demand to know whether dealers handling the car have made money or whether they are losing money attempting to put over a line for which there is no demand, he can demand information which will show him how many automobiles he can be expected to sell in the territory he hopes to enter, the gross amount he will derive from their sale, the number of used cars he will have to handle in order to make those sales, the cost of those used automobiles, and such other information as will indicate whether there will be a profit or a loss for his effort."

This information certainly would be valuable. A lot of people would give a lot of money to get it, but they have had little success in assembling the facts.

If there is anyone in the industry who isn't thoroughly sold on its splendid future, the best thing for him to do is to get out of it immediately. It has its problems, some of them very serious, but it will solve them just as it has many others which have arisen in the past decade. This N. A. D. A. circular doesn't seem, however, to offer any constructive suggestions for remedying unsatisfactory conditions.

# New Instrument Developed to Show True Body of Oils

Method devised for obtaining real comparison of viscosity quickly and easily without calculations. Device is of cup and ball type, and its use in a large number of tests is said to have resulted in saving a considerable amount of time.

By R. W. A. Brewer

Research Department, Sun Oil Company

**T**HE viscosity of an oil is that property which defines the ease or rapidity with which it enters a bearing or with which it is squeezed out again. All the standard instruments used in the past are based on a similar principle, but there is no definite relation between their readings.

As an example, an oil of 100 seconds Saybolt is less than half as viscous as an oil of 200 seconds, the discrepancy being greater as the number of seconds decreases.

Conversion to true viscosity is possible, but the calculation involves other factors and is rather laborious, for which reason it is seldom made. Absolute viscosity can be determined almost directly by means of a new instrument, the Michell, which obviates the need for involved computations. The reading in seconds obtained by means of this instrument, divided by a constant, is the absolute viscosity. The figures given by this instrument, therefore, are a direct measure of the flowing characteristics of an oil under working conditions in an engine.

What an engineer wants to know is the actual "body" of various oils, so that if the oil in use appears to have too little body he can "tag" it with a value which has some definite meaning. From this he can start out in an endeavor to find a more suitable oil.

Further, when an oil is rated by the time it takes for a given quantity to flow through an orifice under the influence of a gravity head, the density of the oil at the temperature of testing has considerable influence upon the result, so that when the oil is diluted by gasoline, as is usually the case, and the weight of a unit volume is less, another error is introduced.

In order to fix in the mind the discrepancy between the "seconds" values and the absolute values, the following figures are taken from the writer's calculations, from which the less viscous oils show up in a marked manner.

| Time in Seconds | Actual Values (millipoises) | Time in Seconds | Actual Values (millipoises) |
|-----------------|-----------------------------|-----------------|-----------------------------|
| 37              | 38                          | 150             | 300                         |
| 50              | 75                          | 200             | 410                         |
| 77              | 150                         | 240             | 500                         |
| 100             | 185                         | 466             | 1000                        |

The Michell instrument has been used by the writer during the last six months for a large number of tests, and its use has saved him a large amount of time and detail calculation.

Experience has shown that, in making determinations on an oil at different temperatures, the points fall on a curve and do not have to be averaged, as is often the case with orifice instruments unless very great care is taken in the experiments.

This instrument is of the "cup and ball" type and the viscosity measurement depends upon the time taken for a very small quantity of oil to flow between the cup and a steel ball which is initially pressed into the cup. The whole apparatus is preferably immersed in a bath of the oil to be tested; a thermometer is inserted in the handle of the cup and the temperature is raised. When equilibrium is reached at, say, 210 deg. Fahr., the ball lying at the bottom of the bath, the cup is pressed over it, care being taken that no air is entrapped.

The handle of the cup is then raised, carrying the ball just clear of the bottom of the bath, and the time is noted by a stop watch. The ball will drop as soon as a film of oil has crept between it and the cup, and the time taken for this action, in seconds, divided by a constant, gives the actual value of the body of the oil.

The reason for the constant, which is generally a simple whole number, is that for the whole range of oils and temperatures it is convenient to have instruments which will give a reading in less than a minute. To make this possi-

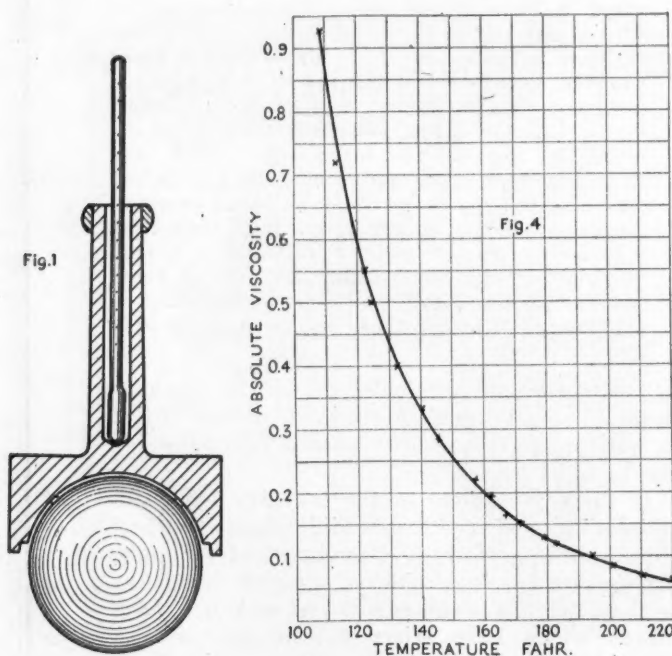


Fig. 1—Section of Michell viscometer showing two of the three projections that separate the ball slightly from the cup

Fig. 4—Example of viscosity curve with 17 points all obtained in less than an hour, including time to heat the sample. Note how accurately the curve follows the observations



ble, three small projections are placed in the face of the cup which regulate the thickness of the film in any one particular instrument.

The writer finds that two cups and balls are sufficient to meet all ordinary needs, and one will suffice for any one oil between the limits of temperature at which tests are usually made.

Because the amount of flow is so small and the distance which has to be traversed by the oil is only about an eighth of an inch, there is no loss of energy or drawing out of the oil into a long thread, as is the case in the earlier forms of testing apparatus.

Sometimes only a few drops of an oil can be obtained, and although when not submerged the instrument errs a little by reason of the change in effective weight of the ball, it can still be used in such a case.

Round the edge of the cup is a small groove which, when full, will entrap sufficient oil for the test. If, now, the cup is inverted and the ball placed in position, the groove can be filled with the sample of oil and the instrument righted again. The ball is held by the finger until it rests on a wood surface, and the test is made as before. If care is taken, no dirt will enter, even though the oil is contaminated, because the ball is a close fit in the cup. This is an important advantage for shop testing. No special skill is needed, as is the case with the orifice instruments, which at least require a certain amount of knack.

As an example of the results obtained the following curve, Fig. 4, is reproduced, and it may be interesting to note that only about an hour was required for the whole work, including both testing and plotting. With an orifice type instrument, it would take quite the same length of time and then only a few points would be obtained. In the comparative table, the absolute unit has been multiplied so as to give whole numbers. This is not entirely correct, but it helps to bring the meaning clearer to the mind. Unfortunately, the unit is small.

Suppose that two blocks of metal are secured to a piece of thick rubber placed between them. If the lower block is held firmly while the upper one is given a push sideways, the rubber is distorted and is submitted to a shearing stress. This stress is directly proportional to the shear modulus of elasticity of the rubber, to the amount of the displacement, and inversely proportional to the thickness of the rubber.

If the rubber is discarded and replaced by an oil film, the factor of the modulus of elasticity will be replaced by the relation

$$\frac{\text{Coefficient of viscosity of oil}}{\text{Time taken to make displacement}}$$

Fig. 2

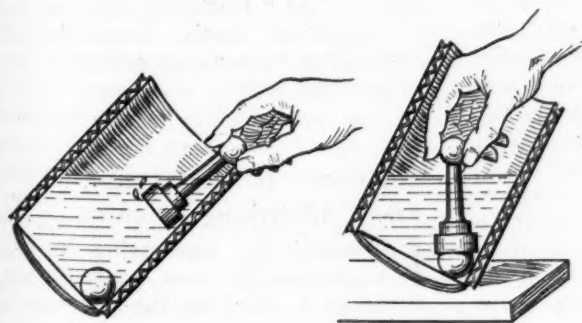


Fig. 2—Method of using Michell viscometer. The stop watch is started with the left hand as the ball is lifted. It is only raised just off the bottom and left submerged throughout the observation

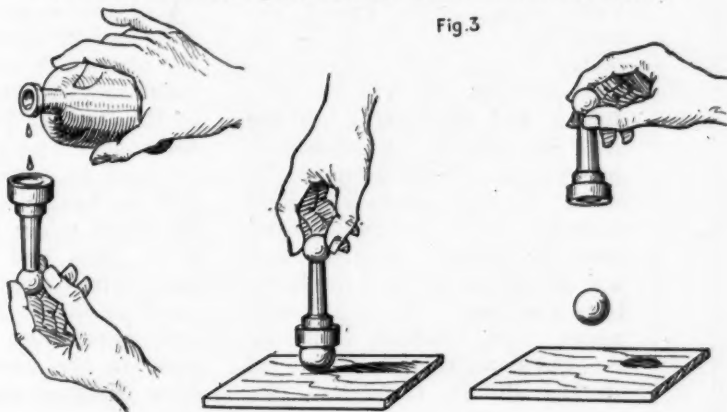


Fig. 3—Slightly less accurate method useful where oil supply is very limited

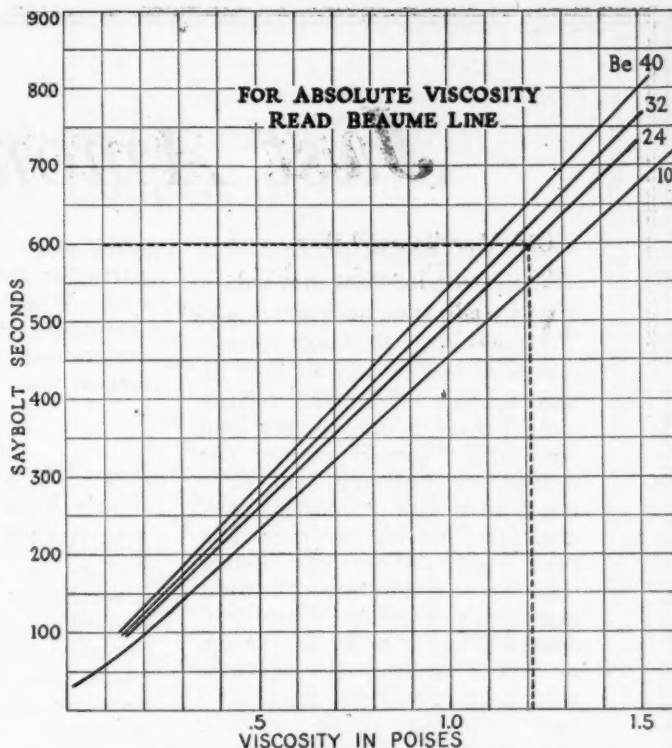


Fig. 5—Chart for converting Saybolt readings into poises

The shear stress now becomes

$$S = \frac{\lambda}{h} \times \frac{\mu}{t}$$

where

$S$  is the shear stress per unit of area

$\lambda$  is the coefficient of viscosity

$h$  is the thickness of oil film

$\mu$  is the lateral displacement

$t$  is the time in seconds to make the displacement

The expression  $\frac{\mu}{t}$  is the velocity with which one block slides over the other, so that the stress is directly proportional to the coefficient of viscosity, to the velocity of displacement and inversely to the thickness of the oil film. From this we get the relation of the coefficient of viscosity

$$\lambda = \frac{h S}{V}$$

A value of unity means that over an infinite area a tangential force of one dyne per square centimeter of surface applied at a distance of one centimeter from the stationary surface causes relative motion of the two surfaces at a rate of one centimeter per second. This unit is the Poise.

# Just Among Ourselves

## Old Man Time Will See Hanging Up of New Record

WHEN old man Time comes out with his well known scythe on the evening of Dec. 31 and hobbles off in the setting sun, if there is one, to seek long and amply earned repose, the automotive industry will have hung up a new production record. Its batting average has been about 50 per cent better than it ever was before. The total may be a few thousand less than 4,000,000 but it won't be enough to worry about. It certainly will be a lot more than anybody expected twelve months ago. It is so much more than we expected that we hesitate to prognosticate for 1924, but we would be willing to wager a trifling sum that it won't show any 50 per cent increase. If it weren't that we would be betting against our team we might risk a few marks on the hunch that the score is much more likely to be a tie.

## Ford's River Rouge Plans Less Than Half Completed

DEVELOPMENT of the River Rouge by Henry Ford constitutes one of the most interesting industrial operations in recent American history. Big as it is now, it will be more than twice as large when it is completed. That will mean the expenditure of an enormous amount of money, but no one outside the Ford organization knows exactly how much. It can be accepted as fact that before Ford gets through he will be producing and fabricating all the steel he uses in his numerous enterprises. That seems to be one of his chief purposes. Raw materials of all kinds will be fed into the Rouge, however, and will go out as finished products. Iron ore taken from his own mines, for example, will be brought down the lakes, dumped at the Rouge, converted into

steel and then fabricated into parts for cars, trucks and tractors. When his glass producing facilities are completed it is understood he will have the largest plant in the world.

## Huge Power Plant Capacity Nearly Equals Muscle Shoals

INCIDENTALLY, every move that has been made at the River Rouge or is made there is evolved in the brain of Ford himself. He has said that he would give employment to one man for every horsepower unit developed. It has taken him twenty years to reach a point in his Detroit operations where he is using 100,000 hp. It is highly significant, therefore, that when his mammoth steam power plant at the Rouge is completed it will be capable of generating 500,000 hp. It will rank among the greatest plants in the world. When all the power in the Tennessee River at Muscle Shoals finally is harnessed it will amount to only 625,000 hp. Ford seems to expect that ultimately he will be employing half a million men in Detroit. The first of eight new 62,500-hp. turbo-generators in the Rouge power house has been virtually completed and work is under way on the second unit.

## All Power Developed Will Be Used in Ford Enterprises

ALL this enormous power production, according to present plans, will be used for Ford industries and the electrification of the Detroit, Toledo & Ironton Railroad. The coal which will be used to generate the power will be hauled to Detroit from the Ford mines over the D., T. & I. New and unique electric locomotives are being built in the Ford shops. The big turbines and generators which will be used in the power house have been designed and will be built

entirely in the Ford shops by the engineers and machinists who have helped to develop Ford automobile production methods. Four additional powdered coal burning boilers have been installed to furnish steam for the new turbines and a total of twelve ultimately will supply the power capacity. So free from smoke and dirt has powdered fueling been found that the boiler attendants now are dressed in white from head to foot.

## Hoover Doesn't Try to Make His Statistics Do Tricks

NO one in the world is such a glutton for statistics as Herbert Hoover. He insists that it is practically impossible to do business intelligently without them and he has done more than any other one man ever did to build up a solid statistical foundation for the nation's business. It can be said without betrayal of confidence that he feels it will be a calamity if the Department of Justice maintains its contention that the collection of statistics by trade associations is a violation of the Sherman law. Hoover doesn't spend his time making his statistics march around in circles, goose-step, roll over, beg and do other tricks. He takes them straight and doesn't try to use them as the basis for forecasting what's going to happen to business as a whole. He sees little profit in "the measles of forecasting" with which the country has been afflicted. As a matter of fact, on a statistical basis, forecasts range from 90 per cent wrong to 70 per cent right.

## Automotive Industry Leads All in Advertising Products

IT would be interesting to know exactly how much is spent in a year for the advertising of automotive products,



## More or Less Pertinent Comment on Topics of Current Interest to Men in the Industry

including cars, trucks, buses, tractors, tires, parts, accessories, oil and gasoline. Including expenditures by both manufacturers and dealers, the total will not fall far short of \$100,000,000, counting all kinds of advertising effort. It is certain no other industry spends so much for this purpose. The General Motors Corp. leads all others in its field in advertising effort. It is spending \$10,000,000 this year and the appropriation for 1924 will approximate \$11,500,000. The Ford Motor Co. campaign next year will cost \$7,000,000, of which dealers will pay half. This would be only about 1 per cent of that company's gross annual sales, while the General Motors appropriation will be only about 1½ per cent of its gross sales. Considerable significance is seen in the fact that Ford has abandoned his non-advertising policy.

### Sanity in Motor Vehicle Regulation Gaining Ground

**S**LOWLY but surely, sanity is creeping into considerations of motor vehicle regulation and accident prevention. The New York Board of Aldermen recently passed an ordinance limiting the speed of buses and sightseeing cars to twelve miles an hour, which is the present limit for commercial vehicles. In vetoing the measure, Acting Mayor Murray Hulbert said: "Acknowledging the desirable object in mind when the proposed ordinance was passed, I cannot escape the feeling that a subject so broad and comprehensive as motor vehicle regulation is one which warrants consideration as a whole and that greater and more permanent benefits will result from a consideration of the entire subject than from periodical efforts to correct particular obvious defects." The wisdom of this contention is none the less apparent because the veto

was actuated primarily by the fact that the city itself is seeking legislative assent to its plan to operate a universal bus service.

### Sam Miles Doing World's Biggest Interior Decorating Job

**S**AM MILES has gone into the interior decorating business on a larger scale than anyone else ever did. All he has to do is to make the mammoth armory in the Bronx where the coming automobile show will be held look like a palace in the time of Louis XVI. Motor cars will serve as furniture, but the roof's the thing. It will be made to look like plaster and panelling, although cotton bunting will be used for the job. Enough electricity to illuminate a town of 5000 population, in the buildings and on the streets, will be required to light the drill shed. He will use a little matter of sixty tons of linoleum to cover the floor as well as a half million square feet of lumber and floor board. While he isn't actually doing the work, Miles is supervising it. If the next show isn't the most successful exposition of its kind in the history of the world it won't be his fault, and he's a mighty good show man. If he had started out with Barnum he might have given P. T. quite a few ideas.

### Transportation Conference Called for N. Y. Show Week

**S**O far as the automotive industry is concerned, it is unfortunate that the Chamber of Commerce of the United States has fixed the week of Jan. 7 for the conference at Washington at which coordination of transportation will be considered from all angles. Automotive men played an important part in the surveys upon which were based the reports of the five commit-

tees considering different phases of the problem. The entire industry is deeply interested in the welding of highway transport into a homogeneous relation to all transportation. It is more directly concerned, however, with the New York automobile show, which will be held the same week. For that reason it is probable comparatively few of its representatives will be able to go to Washington. Consideration should be given to such factors in planning future meetings of the kind because there must be widespread realization of the importance of the question before tangible results can be accomplished.

### Daugherty Anti-Statistics Campaign Growing Serious

**C**OMPILATION of production and consumption statistics by trade associations seems to be anathema to Attorney General Daugherty. The consent decree in the case of the National Tile Manufacturers' Association put another crimp in this work and it has been tangled still further by the decision of Federal Judge Knox in the case of the Cement Manufacturers' Protective Association. He took the position that the exchange of statistics by members enabled them to regulate production so that supply always would be a lap or two behind demand. It may be that some information of this character is used for unfair purposes by some associations, those of the automotive industry NOT included, but most of it is not. If the gathering of statistics, not for restrictive trade purposes but simply as a basis for intelligent planning, is outside the Sherman law as it stands, then business should demand a reasonable modification of the statute with a clear and unmistakable definition of what it can and cannot do in the way of accumulating statistical information. J. D.

# Detailed Service Records Necessary for Intelligent Design

Owner satisfaction is determining factor in future success. General Motors Research Corp. and Oakland develop new methods for obtaining essential data.

By W. L. Carver

**P**ERFORMANCE in the hands of the customer is the real criterion of the value of any line of motor vehicles. The efforts of every contributing factor from the lay-out board to the last point of contact can be measured finally only by the customer's satisfaction. The extent of such satisfaction rests upon the owner's estimate of the original investment plus maintenance costs as compared to the mileage shown on the speedometer. Reputed maintenance costs as compared to mileage shown are the real basis of used car values. In turn, second-hand car value wield a tremendous influence on the promotion of new car sales.

Critical analysis of the efforts of any one of the five primary divisions of the automobile industry will sooner or later resolve itself into terms of the other four. Under the present scheme of organization, five departments are involved: engineering, production, inspection, sales and service. While each of these, in the natural course of affairs, must specialize in a particular phase of work, the best results are obtained when each department bears the whole picture in mind. When either the executive or his assistants become wholly preoccupied with purely departmental affairs, short-sighted vision is bound to retard the commercial growth of the organization.

In the organization scheme outlined the service department is, or rather should be, closest to the customer. The engineering department is, in many respects, the most remote.

This statement is based on the simple hypothesis that the engineering department originates certain car or transportation characteristics which are built as specified by the production and inspection departments. The sales department sells these characteristics to the ultimate customer through the dealer and distributing organization. In the end the service department is engaged in keeping the customer sold on them and the company back of them.

## Cost Must Be Balanced with Service

Granting that the service department is organized on the sound commercial lines which usually characterize the other divisions and, consequently, actually gets to the customer and obtains his viewpoint, the question of success then hinges upon the characteristics of the car. These embrace something more than a well-powered engine, a long wheelbase or a slanting windshield equipped with a rear vision mirror and automatic cleaner. Manufacturers are learning that comfort and first cost must be balanced by continuous, consistent performance and the cost of its maintenance. The average customer will condemn a car for its apparently petty an-

noyances as quickly as for seized pistons or torn-out rear axles.

Due to its position in the scheme of organization, the service department should be the logical instrument for getting the customer's ideas and troubles back to the engineer. Their correction should then be only a matter of commercial policy and expediency, as in the end the car is built for the customer and he is the fellow who must be satisfied. As long as manufacturers fail to balance service ability with production ability, the worry as to the customer's attitude will continue. To insure success most of the service ability must be incorporated in the original design, but the loose ends can be picked up by the service department. If the information is thorough and comprehensive and is available while it is still current, it should be invaluable in putting over the existing model and serve as the guide book for anticipated designs.

## Make Records Readily Available

In the past, service records, where kept in any sort of condition, have lost much of their value due to their very form. The search for a germ of real information through a heavy volume of pages approximating 6 sq. ft. in area is in itself enough to divert the ambitious engineer from his pursuit. Most service records, moreover, are merely entries or repair parts shipments which are totally unreliable and inconclusive in solving the true service problems. If the customer were compelled to buy replacement parts every time service were rendered, the automobile industry would have landed on the rocks long ago. An occasional shipment of valves or pistons is a mighty inefficient index of motor service complaints. Shipments of lens retaining rings have very little bearing on burnt-out bulbs, the aggravation resulting from loose headlight terminals or the troubles, legal and otherwise, that follow upon insecure focusing devices.

Both the car and its troubles are viewed as entities by the customer. The car either performs or it does not. If it does not, service is required for certain reasons. These reasons are the truths that the service department can bring back to the design engineer. The latter can investigate and analyze to arrive at the cause. The relative commercial importance of service complaints is to be determined by their frequency and source. Above all, the service reports must be current information and must be presented in a tangible, graphic manner.

Two noteworthy developments along this line are already in operation. The first, which was described by O. T. Kreusser at the recent Dayton service meeting, is in use at the General Motors Research Corporation. A

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| CAR | ENGINE             |  |                |  |                    |  |        |  |                              |  | ELECTRICAL     |  |           |  | CLUTCH & TRANS |  |        |  | RUNNING GEAR |  |                    |  |            |  | BODY  |  |         |  |          |  |         |  |             |  |      |  |     |  |       |  |
|-----|--------------------|--|----------------|--|--------------------|--|--------|--|------------------------------|--|----------------|--|-----------|--|----------------|--|--------|--|--------------|--|--------------------|--|------------|--|-------|--|---------|--|----------|--|---------|--|-------------|--|------|--|-----|--|-------|--|
| NO  | STATIONARY MEMBERS |  | MOVING MEMBERS |  | LUBRICATING SYSTEM |  | VALVES |  | INDUCTION AND EXHAUST SYSTEM |  | COOLING SYSTEM |  | GENERATOR |  | STARTING MOTOR |  | CLUTCH |  | TRANSMISSION |  | REAR AXLE OPERATOR |  | FRONT GEAR |  | FRAME |  | SPINDLE |  | STEERING |  | BRAKING |  | INSTRUMENTS |  | BODY |  | TOP |  | METAL |  |
| 4   |                    |  |                |  |                    |  |        |  |                              |  |                |  |           |  |                |  |        |  |              |  |                    |  |            |  |       |  |         |  |          |  |         |  |             |  |      |  |     |  |       |  |
| 37  |                    |  |                |  |                    |  |        |  |                              |  |                |  |           |  |                |  |        |  |              |  |                    |  |            |  |       |  |         |  |          |  |         |  |             |  |      |  |     |  |       |  |
| 63  |                    |  |                |  |                    |  |        |  |                              |  |                |  |           |  |                |  |        |  |              |  |                    |  |            |  |       |  |         |  |          |  |         |  |             |  |      |  |     |  |       |  |
| 64  |                    |  |                |  |                    |  |        |  |                              |  |                |  |           |  |                |  |        |  |              |  |                    |  |            |  |       |  |         |  |          |  |         |  |             |  |      |  |     |  |       |  |
| 27  |                    |  |                |  |                    |  |        |  |                              |  |                |  |           |  |                |  |        |  |              |  |                    |  |            |  |       |  |         |  |          |  |         |  |             |  |      |  |     |  |       |  |
| 28  |                    |  |                |  |                    |  |        |  |                              |  |                |  |           |  |                |  |        |  |              |  |                    |  |            |  |       |  |         |  |          |  |         |  |             |  |      |  |     |  |       |  |
| 36  |                    |  |                |  |                    |  |        |  |                              |  |                |  |           |  |                |  |        |  |              |  |                    |  |            |  |       |  |         |  |          |  |         |  |             |  |      |  |     |  |       |  |
| 62  |                    |  |                |  |                    |  |        |  |                              |  |                |  |           |  |                |  |        |  |              |  |                    |  |            |  |       |  |         |  |          |  |         |  |             |  |      |  |     |  |       |  |
| 106 |                    |  |                |  |                    |  |        |  |                              |  |                |  |           |  |                |  |        |  |              |  |                    |  |            |  |       |  |         |  |          |  |         |  |             |  |      |  |     |  |       |  |
| 109 |                    |  |                |  |                    |  |        |  |                              |  |                |  |           |  |                |  |        |  |              |  |                    |  |            |  |       |  |         |  |          |  |         |  |             |  |      |  |     |  |       |  |
| 110 |                    |  |                |  |                    |  |        |  |                              |  |                |  |           |  |                |  |        |  |              |  |                    |  |            |  |       |  |         |  |          |  |         |  |             |  |      |  |     |  |       |  |
| 77  |                    |  |                |  |                    |  |        |  |                              |  |                |  |           |  |                |  |        |  |              |  |                    |  |            |  |       |  |         |  |          |  |         |  |             |  |      |  |     |  |       |  |
| 19  |                    |  |                |  |                    |  |        |  |                              |  |                |  |           |  |                |  |        |  |              |  |                    |  |            |  |       |  |         |  |          |  |         |  |             |  |      |  |     |  |       |  |
| 39  |                    |  |                |  |                    |  |        |  |                              |  |                |  |           |  |                |  |        |  |              |  |                    |  |            |  |       |  |         |  |          |  |         |  |             |  |      |  |     |  |       |  |
| 12  |                    |  |                |  |                    |  |        |  |                              |  |                |  |           |  |                |  |        |  |              |  |                    |  |            |  |       |  |         |  |          |  |         |  |             |  |      |  |     |  |       |  |
| 55  |                    |  |                |  |                    |  |        |  |                              |  |                |  |           |  |                |  |        |  |              |  |                    |  |            |  |       |  |         |  |          |  |         |  |             |  |      |  |     |  |       |  |
| 31  |                    |  |                |  |                    |  |        |  |                              |  |                |  |           |  |                |  |        |  |              |  |                    |  |            |  |       |  |         |  |          |  |         |  |             |  |      |  |     |  |       |  |
| 33  |                    |  |                |  |                    |  |        |  |                              |  |                |  |           |  |                |  |        |  |              |  |                    |  |            |  |       |  |         |  |          |  |         |  |             |  |      |  |     |  |       |  |
| 11  |                    |  |                |  |                    |  |        |  |                              |  |                |  |           |  |                |  |        |  |              |  |                    |  |            |  |       |  |         |  |          |  |         |  |             |  |      |  |     |  |       |  |
| 66  |                    |  |                |  |                    |  |        |  |                              |  |                |  |           |  |                |  |        |  |              |  |                    |  |            |  |       |  |         |  |          |  |         |  |             |  |      |  |     |  |       |  |
| 68  |                    |  |                |  |                    |  |        |  |                              |  |                |  |           |  |                |  |        |  |              |  |                    |  |            |  |       |  |         |  |          |  |         |  |             |  |      |  |     |  |       |  |
| 69  |                    |  |                |  |                    |  |        |  |                              |  |                |  |           |  |                |  |        |  |              |  |                    |  |            |  |       |  |         |  |          |  |         |  |             |  |      |  |     |  |       |  |
| 58  |                    |  |                |  |                    |  |        |  |                              |  |                |  |           |  |                |  |        |  |              |  |                    |  |            |  |       |  |         |  |          |  |         |  |             |  |      |  |     |  |       |  |
| 70  |                    |  |                |  |                    |  |        |  |                              |  |                |  |           |  |                |  |        |  |              |  |                    |  |            |  |       |  |         |  |          |  |         |  |             |  |      |  |     |  |       |  |
| 60  |                    |  |                |  |                    |  |        |  |                              |  |                |  |           |  |                |  |        |  |              |  |                    |  |            |  |       |  |         |  |          |  |         |  |             |  |      |  |     |  |       |  |
| 65  |                    |  |                |  |                    |  |        |  |                              |  |                |  |           |  |                |  |        |  |              |  |                    |  |            |  |       |  |         |  |          |  |         |  |             |  |      |  |     |  |       |  |
| 57  |                    |  |                |  |                    |  |        |  |                              |  |                |  |           |  |                |  |        |  |              |  |                    |  |            |  |       |  |         |  |          |  |         |  |             |  |      |  |     |  |       |  |

1. Service reports are made under 125 specific heads in this form devised and used by the General Motors Research Laboratory in recording service troubles

Following are the items which appear on the chart:

#### Engine

##### 1. Stationary Members

- Cylinder Block
- Cylinder Head
- Crankcase
- Oil Pan
- Engine Supports
- Gaskets and Washers

##### 2. Moving Members

- Crankshaft
- Crankshaft Bearings
- Connecting Rods
- Connecting Rod Bearings
- Pistons and Rings
- Piston Pins and Bearings
- Camshaft and Bearings
- Gears, Sprockets and Chains
- Flywheel

##### 3. Lubricating System

- Lubrication Supply
- Oil Pump
- Oil Leads, Troughs and Pockets
- Oil Scoops and Dippers
- Oil Leaks

##### 4. Valves

- Inlet Valves
- Exhaust Valves
- Valve Lifters, Rockers and Push Rods
- Valve Guides
- Valve Springs and Retainers
- Valve Adjustment
- Valve Grinding

##### 5. Induction and Exhaust System

- Fuel Tank
- Fuel Lines
- Vacuum Tank
- Carbureter
- Intake Manifold

- Exhaust Manifold
- Exhaust Pipe and Muffler
- Gaskets
- Carbon Cleaned

##### 6. Cooling System

- General Operation
- Radiator
- Water Connections
- Fan
- Fan Belt

#### Electrical

##### 1. Generating

- Generator Electrical Troubles
- Generator Mechanical Troubles
- Generator Control

##### 2. Starting

- Storage Battery

##### 3. Starting

- Starting Motor Electrical Troubles
- Starting Motor Mechanical Troubles
- Starting Motor Controls

##### 4. Ignition

- Coil
- Breaker and Distributor Adjustment
- Breaker and Distributor
- Spark Plugs
- Switch

##### 5. Lighting and Signalling

- Bulbs
- Fuses
- Switches
- Horn

##### 6. Wiring

- Low Tension Wiring
- High Tension Wiring

#### Clutch and Transmission

##### 1. Clutch

- Friction Mechanism
- Control Mechanism
- Bearings
- Operation

##### 2. Transmission

- Transmission Case
- Gears
- Shafts
- Bearings
- Control Mechanism
- Operation

##### 3. Propeller Shaft

- Shaft
- Universal Joints

##### 4. Rear Axle

- Differential Cage
- Gears
- Shafts
- Bearings
- Housing
- Torque Member
- Wheel Bearings
- Wheel Attachment

#### Chassis

##### 1. Running Gear

- Front Axle
- Steering Spindles
- Wheel Spindles
- Front Wheel Bearings
- Wheels and Rims

##### 2. Frame

- Breakage
- Rigidity
- Brackets, Hangers and Cross Members
- Rivets and Bolts

##### 3. Springs

- Leaves
- Shackle Bolt and Clip Adjustment

- Shackle Bolt and Clip Replacement

##### 4. Steering

- Adjustment
- Steering Gear
- Drag Link and Tie Rod
- Operation

##### 5. Braking

- Adjustment
- Lining
- Operating Mechanism
- Operation

##### 6. Instruments

- Oil Indicator and Gage
- Ammeter
- Gasoline Gage
- Engine Temperature Indicator
- Speedometer

#### Body

##### 1. Body

- Frame
- Covering
- Supports
- Finish
- Upholstering
- Hardware
- Windshield
- Instrument Board
- Running Boards and Floor Boards

##### 2. Top

- Frame
- Covering
- Curtains

##### 3. Sheet Metal

- Hood
- Radiator Shell
- Fenders
- Splash Aprons
- Supports and Fastenings
- Lamps





|                                                    |                           |
|----------------------------------------------------|---------------------------|
| Form 115 1M 10-23                                  |                           |
| OAKLAND MOTOR CAR COMPANY - CAR PERFORMANCE REPORT |                           |
| Name of Branch or Distributor _____                | Date _____                |
| No. Cases _____                                    | Unit Affected _____       |
|                                                    | Model _____ Car No. _____ |
|                                                    | Speedometer Reading _____ |
| Diagnosis _____                                    |                           |
| Remedy Applied _____                               |                           |
| Comment or _____                                   |                           |
| Suggestions _____                                  |                           |
| Signature of Service Manager _____                 |                           |
| -use reverse side for further comment-             |                           |

Fig. 5—Report filled in by the distributor and forwarded to Oakland factory. From these reports the master charts are built up

need for increased attention at several points is indicated. The same form of record, compiled from the current service reports of a given make of car, would readily demonstrate the strategic points of the engineering program. Excerpts from Kreusser's paper are quoted here to demonstrate the feasibility of this type of record.

"The density of dots under particular headings automatically brings out that point. The chart does not indicate the particular nature of the trouble any more than the red signal advises the railroad engineer of what is happening in the block ahead, but it does indicate that there is need of attention and investigation.

"The troubles we expect in motor cars and the improvements the engineer contemplates making, do not always conform to the items that are causing the customer the most trouble in the field.

#### Handle Serious Troubles First

"The number of engineering department investigations that might be warranted immediately narrows down to an easy determination of the most serious troubles which are handled first. The value of this kind of record is that it pertinently points out shortcomings in one's own product that oftentimes are overlooked as being of minor importance.

"With very little education on the part of the service department, the field with the various repair stations and the people who represent them can make this kind of information available to the engineering department at all times with very little effort or delay.

"The service manager must take the same interest in the folks that represent his department in the field by helping them to run business economically and efficiently.

"The information that is obtained locally permits one to analyze the desirability of special equipment for handling particular types of service operations.

"A chart of this kind on a small scale designed to cover a particular production can be got out profitably by any company. Every authorized service station can place dots in the specified spaces to form a complete current record of each day's work. In return for the help given by the service manager the service station gives him a carbon copy of the weekly chart.

"To identify closed from open cars on the master chart, different colors or different shapes of dot or a combina-

tion of the two can be used. It is suggested that a dot represent five cases of trouble. The first case is represented by an open circle and the succeeding four cases are represented by filling in successive quarters. As an alternative, colored tacks or glass headed pins may be used.

"The value of this record is dependent upon the co-operation received from the various service stations. This factor constitutes a problem which must be worked out by the individual organization, the approach being varied to conform with past experience.

#### Establish Personal Contact

"We feel that no difficulty would be experienced in the field if proper personal contact were established by periodical calls by your representative. His interest in helping the service garage along sound business lines will have great influence.

"In conjunction with the flat-rate system which is now being generally adopted, the record could be taken daily from the job cards. In accordance with the basic feature of the plan, no detailed comment would be necessitated; merely checking off the correction made in the shop on the weekly chart would supply the requisite information.

Many of the features of this plan are incorporated in the service record which has been in use at the plant of the Oakland Motor Car Co. since the announcement of the new model. Their master charts are made up as shown in Figs. 1, 2, and 3; each of which is a blueprint of 18 in. by 24 in. The graphical portion of these charts is built up on a monthly basis and the accrued totals for the previous months and the fiscal period are entered at the lower portion of each column. The number of dots is based upon the reports from the distributing points listed at the left side of the charts. These reports, as illustrated by Fig. 5, are filled out at the distributor's office and forwarded to the home plant.

The distributor's information is gained through direct contact with the dealer as well as by dealer's complaints. After being tabulated at the home office, blueprints are made and forwarded with comments to executives of every department, including the general manager, sales manager, assistant sales manager, works manager, service manager, chief engineer and chief inspector. These men are already sold on the graphical presentation of field troubles. No effort is made to indicate mileage on the master charts, as it is felt that any high spots will be followed by an immediate examination of the distributor's reports for that particular heading. In addition to this system, the former practice of tabulating repair parts shipments from the distributors' stocks is continued, particular attention being paid to parts which have been replaced in fulfillment of the company's guaranty. This information is tabulated in concise form and distributed to the same list of executives.

#### Educate Dealer Organization

Particular attention has been given to the elements of education and dealer and customer contact. Prior to the announcement of the new model, service men from the various branches and distributing points were brought into the plant and given a thorough drilling in the servicing of the new cars. At the present time, service clinics are being held at these points for the service men of that district. All of these sessions are devoted not only to the actual service operations, but also to best methods and types of tool equipment. Suggestions are made for the disposition of repair stocks, repair floors and general organization.

To assure the utilization of the company's methods

and policies, factory service representatives are stationed at the distributing points. Also, representatives travel directly out of the home plant, calling upon distributing points branches, local dealers and customers. These men are required to report very thoroughly on conditions existing at every town in their itineraries. These reports cover every phase of the dealer's service work, including size and arrangement of the shop and repair stock, character of personnel, a detailed check of standard and recommended tool equipment, and a general analysis of the shop as a business establishment.

Examples of the items involved in this report are as follows:

#### Parts Department

Size ..... Where location in relation to street .....  
Kind and condition of equipment.....  
Approximate value of stock on hand.....  
Is dealer's stock adequate? ..... Is dealer's stock well balanced?.....  
Will he keep stock straight? .....  
Sketch outline of parts room and service station

#### Service Department

Size ..... Kind of floor ..... Entrance .....  
Well lighted? ..... Kept clean? .....  
How many repair jobs handled per day? .....  
How many quick adjustments? ..... Where done? .....  
Number mechanics?..... Helpers?..... Porters?.....  
Office help? .....  
Does branch or distributor have traveling mechanic?...

What time system? .....

Rate per hour .....

Is dealer using flat-rate system? ..... Why not? .....

Does dealer maintain scrap book of service letters?.....

Do these letters reach shop men?.....

Who receives and interviews customers?.....

What is your impression of such a man?.....

What is his treatment of customers?.....

Give the names and addresses of five owners whom you have interviewed, together with their replies as to dealer's service.

(Representatives are required to go out and find these people and interview them away from the service stations. One method of establishing contact is obtained by stopping drivers on the street. Care is given to obtaining the owner's unbiased opinion.)

Following this questionnaire is a detailed list of approved tools, which is checked over for each item and appended with a general comment of the tool equipment.

Copies of this report are forwarded to the sales and service department at the home office and branch in whose territory the dealer is located. One copy is retained by the traveling representative. Although this scheme is somewhat different than that outlined by Kreusser, it will be seen that rather adequate provisions are made to acquire service knowledge and at the same time establish a broad service relationship with the dealer and customer. Much of the first policy has been adapted to the machinery which was already in existence.

## Theory of Internal Combustion Engines Discussed

IN most branches of engineering, as in electrical work, the refrigerating industry and the liquefaction of gases, practice has followed the progress of science, but in the field of internal combustion engine practice has run ahead of theoretical deductions. That may be one of the reasons why practical men in the automotive field sometimes have little use for theoretical discussions, because, if the theoreticians can only tell us that certain things which we already practice must be possible, they are of little practical help. At the same time theoretical explanations of certain phenomena on the basis of fundamental laws are often highly interesting.

In internal combustion engines we have to deal in the first place with chemical phenomena, the combustion of the fuel, which, of course, is subject to certain laws. The chemical reaction between the fuel and the oxygen of the air is influenced by the temperature and the pressure within the combustion chamber, and the influence of these factors is different with different fuels.

Investigations of these phenomena fall within the field of physical chemistry, which science has been greatly developed during the past thirty years, its leading exponents being Van't Hoff, Arrhenius, Ostwald and Nernst. They established the laws of chemical reactions and their accompanying physical phenomena, formulating them in mathematical terms.

A knowledge of these laws should be very helpful and practically indispensable to those working toward the improvement of internal combustion engine fuels and the conditions of their use in engines.

The laws above referred to are summarized and their application to internal combustion engine operation is discussed in *Contribution a la Theorie des Moteurs a*

*Combustion Interne* (Contribution to the Theory of Internal Combustion Engines) by M. Brutzkus, published by Gauthier-Villars et Cie. of Paris. One of the conclusions drawn in this work is that a fuel which burns with an increase in the number of molecules gives a higher thermal efficiency than one which burns with a decrease in the number of molecules. The more complex the molecules of the fuel the more the number of molecules is increased on combustion. For instance, in the case of nonane, which is characteristic of our present-day gasoline, the number of molecules is increased in the ratio of 15 to 19.

On the other hand, in the case of marsh gas, the lowest member of the paraffin hydrocarbon series, the number of molecules remains the same when the gas is burned, and in the case of hydrogen the number of molecules even decreases in the proportion of 3 to 2.

The book takes up the effects of temperature, pressure and concentration on the chemical process of combustion and gives a number of tables of experimental data, mostly from German sources, to support the conclusions drawn.

SIR H. C. HOLDEN of London has invented a device enabling ordinary motor vehicles to travel on rails and cars built for rail service to travel on roads. The invention has been applied to a four-wheel drive truck to adapt it for use on rails. The truck is fitted with high carbon cast steel spoked track wheels. By means of a tapered loose rim a solid tire with its steel band can be secured over the tapered surface of the track wheel. The rubber tires can be removed from the four wheels in about ten minutes and replaced in about half an hour.



# How to Identify Nickel and Other Steels at the Bins

Certain physical means can be employed in some instances. Sparks from emery wheel give indications as to carbon content and certain alloys such as chromium and tungsten. Simple chemical test for indicating presence of nickel is easily applied.

By Horace C. Knerr  
*Metallurgist, Naval Aircraft Factory*

**H**OW to separate steels of different composition which have lost their identification and become mixed in stock or in handling is sometimes a serious problem in manufacturing plants, especially where high grade steels requiring heat treatment corresponding to their compositions are used.

Chemical analysis of every piece is usually out of the question. Hardness tests are an aid if the physical condition of the steels are known. That is, an alloy steel of the same carbon content as a plain carbon steel will be harder than the latter if both are in the annealed or in the quenched condition. But if the alloy steel is in the annealed state and the carbon steel has been cold rolled or quenched, then the hardness may be too nearly the same to furnish a distinction. This also applies to carbon steels of different carbon content.

In such cases small coupons may be cut from the pieces under question, quenched, and then rapidly tested for hardness by Brinell or scleroscope. In case the steels are such that both would give the same hardness in the quenched condition, but require different quenching temperatures (having different critical points), the coupons may be quenched at a temperature which will harden one but not the other, whereupon hardness tests will distinguish them. This requires close temperature control.

If the carbon content of mixed steels differs considerably, say by 0.30 per cent carbon or more, they can be sorted by the well known spark test, which consists simply in touching the piece with moderate pressure against a clean dry emery wheel revolving at high speed. The higher carbon steels will give a quantity of white sparks which seem to explode as they shoot out. With less carbon the spark will be darker and have streaks of glowing red. The sparkling quality decreases with the carbon. There is almost none of the explosive or branching effect with mild steel or carbonless iron.

## Knowledge of Sparks Needed

One should familiarize himself with the sparks of various steels of known carbon content before attempting this test.

Spark tests can also be used by a skilled operator to sort out certain distinctive alloy steels, such as high speed steel, manganese steel, etc., by noting the color and other peculiarities of the spark. Prof. John F. Keller of Lewis' Institute has prepared a chart illustrating the characteristic sparks of a few important carbon and alloy steels. Among other points he explains that the sparks from chromium and tungsten high speed steels are easily identified, as they follow a broken line with every slight explosion, being chrome yellow, and showing no trace of the

carbon spark, although about 0.65 per cent of carbon is present in the steel. A heavy pressure is required.

Unfortunately the spark test is not sufficiently delicate to distinguish the milder carbon and alloy steels used in automotive structural parts.

## Microscope Test

A more accurate estimate of carbon content than is obtainable by the spark test can be made with the metallurgical microscope. Small specimens are cut off, fully annealed to the pearlitic state, polished, etched and examined at about 100 diameters. With practice, the carbon content can be estimated to within about plus-or-minus 0.05 per cent carbon in low carbon steels and 0.10 per cent in high carbon steels, by judging the relative amount of pearlite and ferrite or free cementite present. A 0.90 per cent carbon steel will be all pearlite, a 0.45 per cent carbon steel half pearlite, half ferrite, a 0.30 per cent carbon steel one-third pearlite, etc. With 1.00 per cent carbon and upward there will be an increasing network of free cementite visible at grain boundaries. The presence of certain alloying elements, such as chromium, complicate this test, but it is very serviceable for carbon steels, and has frequently been used by the writer as a rough check on chemical analysis.

Some work has been done recently at the Bureau of Standards on methods of etching polished specimens for examination under the microscope, whereby a few constituents such as chromium and tungsten can be identified, but the method is necessarily tedious and requires a skilled metallographer.

Fortunately there is one test which is almost ideal in its simplicity, and although it is applicable to only one type of alloy steel, is of very great value because of the importance of that steel in industrial work. This is a test for distinguishing nickel steels from all steels containing no nickel. It can be applied to raw stock or finished parts, as it has no effect on the steel other than a slight acid stain on a small spot, which can be removed by polishing, if desired. This test can be performed in a few seconds at the stock bins or in the shop by an operator of moderate intelligence, and the cost of the necessary equipment is negligible.

A great deal of trouble was experienced at one time at the Naval Aircraft Factory on account of the accidental mixture of a number of bars of carbon steel with the 3½ per cent nickel steel stock, of which there was several years' supply on hand at the close of the war. Most of these odd bars were of mild carbon steel, and their presence was not detected until the hardness test was applied to the machined parts after heat treatment.

It was then necessary either to test every one of the batch to separate the carbon steel parts from the nickel steel, or to reject the entire lot. In either case, a large loss of labor and material was entailed. In case the odd bar was of high carbon steel, as occasionally happened, the parts made from it hardened practically the same as the nickel steel parts, and there was grave danger of their evading detection. Such parts generally had as high tensile strength as the nickel steel, but were of course deficient in ductility and consequently liable to failure.

Through the assistance of the U. S. Bureau of Standards, a very simple, rapid and effective method for detecting these carbon steel bars was obtained. This test is now applied to every bar of supposed nickel steel taken from the stock bins, immediately before release to the shop, and has been the means of saving thousands of dollars by preventing the carbon steel bars from getting into production. The test is as follows:

**Material Required**—Nitric acid, specific gravity 1.20 (one part concentrated acid, one part water); dimethylglyoxime solution, as follows: One gram of the salt, plus 60 cc. acetic acid 80 per cent, plus 30 cc. ammonium

hydrate sp. gr. 0.90, plus 10 grams ammonium acetate; two small glass bottles for solution; two medicine droppers; filter paper cut into small strips.

**Procedure**—A small area on the steel is cleaned of grease, rust or scale—by filing or grinding, if necessary. A drop of nitric acid is placed on the cleaned surface and allowed to attack the steel for about ten seconds. The drop is then absorbed in a small strip of filter paper laid on top of it. Two drops of the dimethylglyoxime solution are applied to the spot on the paper, which will turn strawberry pink if the steel contains nickel, or red-brown if free from nickel. The colors are easily distinguished when once compared. Care must be taken not to contaminate either solution.

The test is said to be sensitive to as low as 0.17 per cent nickel, but the pink color is faint if nickel is very low. No difficulty has been experienced through the presence of traces of nickel in carbon steel stock.

Tests of a similar character for the rapid detection of other alloying elements such as chromium, vanadium, molybdenum, etc., would be highly valuable, but at present are apparently not available.

## New Volumes for the Business Bookshelf

**I**N thirty-seven pages the Foreign Commerce Handbook, recently put out by the Foreign Commerce Department of the Chamber of Commerce of the United States, succeeds in giving a tremendous amount of specific information about the sources of data concerning foreign trade. This pamphlet tells briefly where to find any piece of desired information relating to overseas sales. An alphabetical list of topics in the front makes reference easy and the brief statements regarding each item make the book very valuable for any export executive.

Exporters will find in the pamphlet many things they already know, but scarcely anyone is likely to have at hand all of the information included.



**K**ENT'S Mechanical Engineers' Handbook, familiar to almost every engineer and draughtsman engaged in the design of mechanical equipment, has appeared in a new edition, the tenth, and this time a radical change in the preparation of the volume has been made, in that the cooperation of thirty-five experts in various branches of mechanical engineering and the underlying sciences was secured.

It is hardly necessary to point out that the work has greatly benefited by this cooperation. Although the ninth edition was a rather portly volume, the new edition is materially larger, containing 2247 pages.

A number of new sections have been added, such as those on Automotive Vehicles, Aeronautics, Forge Shop, Fusion Welding and Cutting, Malleable Castings, etc. But the sections which are continued from the earlier edition have in many instances been completely revised and added to. Even the mathematical section, which appears to be the foundation of every engineering handbook, has been added to, to a considerable extent. This section includes new tables of three-halves powers, chords, rise of arc and center angle of circle, radians, decimals of a foot equivalent to inches, decimal equivalents of common fractions with prime numerator and de-

nominator, contents of horizontal cylindrical tanks filled to various depths, and integral forms. This list of additions to the mathematical tables serves very well to illustrate the endeavor of the editor-in-chief, Robert Thurston Kent, to make the book as complete as possible.

The section on Automotive Vehicles is by Prof. Walter E. Lay of the University of Michigan, and contains in a comparatively limited space a large amount of useful data on the design, tests and performance of automobiles. One suggestion we would like to make in connection with the section on Automotive Vehicles is that when the twelfth edition is prepared "foot" be deleted from "foot-pedal."

The new Kent is furnished in two bindings, genuine leather and Atholeather.



**P**RIOR to the war the Yearbook of the Touring Club of Italy formed a fertile source of information on the automobile business in Italy, but for eight years after 1914 no new editions appeared. The first post-war edition of the publication, which bears the title of Automobile and Motorcycle Yearbook of the Touring Club of Italy for 1923-4, has just come to hand. While it follows its predecessors in style, it has been completely rewritten.

The volume forms a sort of encyclopedia of the automobile movement in Italy. It contains about 700 pages, is illustrated by about 600 engravings, and is divided into twelve sections. The section headings will serve to give a good idea of the contents. The construction of the automobile and the motorcycle is briefly described in non-technical language; then there is a review of Italian productions in the automobile field, followed by a list of automobile and motorcycle events, a bibliography, returns of imports and exports, rules to be observed in taking cars into foreign countries, statistics of motor bus services in Italy, etc. In addition the volume contains lists of the more important manufacturers of automobiles, motorcycles and accessories, of garages, repair shops, filling stations, tire stations and supply stores.



# High Tide of Motor Car Buying Alarms Other Trades

Their own sales slipping,  
they hold automobile time  
payment business a menace

By James Dalton

CONSIDERABLE apprehension seems to prevail in several of the older trades over the enormous sums which are being spent for the purchase of motor cars. It is no exaggeration to say that they view the situation with alarm, especially the huge volume of buying which is being done on the installment plan. It is contended that a large percentage of the persons who acquire cars on deferred payments can find no economic justification for their course and that they are a menace to the nation's prosperity.

The attitude of those who "view with alarm" the heavy buying of automobiles was expressed quite clearly by Roger Babson in a recent speech in which he said:

"The tremendous amount being spent on automobiles is making it impossible for people to purchase as much of other things as heretofore. Up to recently, people who bought automobiles were well-to-do and it simply meant that they had a little less money to invest. Many of those, however, who have been buying cars during 1923 must either give up these cars or else restrict their other purchases."

Babson added that "the people of the world are not paying for their current purchases out of their current earnings but are pledging the future to buy." He seems to feel, in other words, that all retail purchases should be made on a spot cash basis.

We recently received a letter from the editor of a journal devoted to the clothing trade in which he said that after a special tour of investigation in which he went from State to State, city to city and village to village, calling on merchants, bankers, industrial leaders and others, he was firmly convinced "that the automobile industry is heading itself into disaster if it pursues this partial payment plan much further."

## Public Entitled to What It Wants

He seemed to regard as flippant the inquiry in a recent article in *AUTOMOTIVE INDUSTRIES*: "Is it a sin for the people to spend their money for automobiles instead of clothing, furniture, etc.?"

We plead not guilty to the charge of flippancy and we stand on the assertion that American citizens are entirely justified in buying what they want rather than what other people think they ought to have. If they prefer more motor cars and fewer commodities, such as clothing and furniture, we insist it is their own business. It is possible today to buy a perfectly serviceable automobile for what a modest three-piece living room suite would cost.

If a family prefers to go without a full quota of clothing so it can afford to operate a little automobile, it's bad

THE automotive industry contends that every man has an inalienable right to spend his own money for what he wants most. If he prefers motor cars to clothing or furniture it's his own business provided he doesn't use funds which belong to other creditors.

for the makers and sellers of clothing but we can see in it no economic menace.

We insist that individuals are justified in determining for themselves the relative desirability to them of different commodities offered them. They are entitled to spend their own money for what they want.

When we say a person has a right to spend his *own* money we mean just that. Complaint is made in various quarters that there is rather a large class of automobile buyers who keep up their payments on motor cars but who do it at the expense of other creditors. These people, it is asserted, fail to meet notes or other obligations previously contracted and continually ask the indulgence of merchants from whom they buy necessities so that they can meet automotive operating expenses.

## Uneconomic Spending Not Justified

These motorists are not spending their *own* money for cars, but money which belongs to *others*. Neither moral nor economic justification can be found for their course. We offer no apologies for them, although persons of the same type probably were following the same general course in the pre-automobile days.

It is rather illogical, however, to condemn the automobile manufacturer and dealer because people who do not pay other bills promptly buy cars on time, inasmuch as they do meet promptly their automobile payments. The man who doesn't pay his grocer or butcher or doctor bills is not a good credit risk, but the average merchant is concerned exclusively with what an applicant for credit will do in meeting his own particular bills and not what he does with the other fellow's.

Merchants who are suffering from the depredations of motorists of this type are not without recourse, however, and they are entirely justified in taking whatever action they can to collect their bills.

It is not difficult to see why bankers, big and little, "view with alarm" the billions which are being turned into the automotive industry. The average family which buys a car in the less than \$1,000 price class would do one of three things with the money:

1. Spend it for commodities no more essential than an automobile.
2. Deposit it in a bank.
3. Invest it.

The banker would stand to win on two of these alternatives. If the money was deposited, he would be able to lend it at a much higher interest rate than he pays. A large part of the millions loaned by big banks to big business comes from a multitude of these small accounts in

## Motor Car Has Stronger Lure Than Either Furs or Furniture



*Buying habits of the American people are changing since individual transportation has become available to all. With a large percentage of the total population enrolled as motorists, changes in trade trends are inevitable*

thousands of small banks. If this flood were stopped there would not be so many loans. It is highly significant, however, that in spite of the enormous volume of automobile sales the total of savings bank deposits is steadily mounting.

There are two classes of investments which are justifiable for a family of this type:

1. Government or equally high class bonds.
2. Real estate or real estate mortgages.

The bank, especially in the smaller centers, usually has a hand in the placing of investments of this character, and we have not heard that there is any dearth of money for such purposes. It should not be forgotten, however, that a large number of banks have had a large part, either openly or semi-secretly, in the flotation of a large number of stock companies which have eked out a precarious existence for a short time and then failed, with the stockholders, most of whom could ill afford to lose, "holding the bag." An automobile is vastly more valuable than such an investment, even for widows and orphans.

There undoubtedly are a great many morons, idiots and imbeciles in the United States who are not confined in institutions as well as a great many more who are wholly ignorant of the rudiments of finance and business. Their favorite pastime in the past has been keeping themselves poor buying worthless securities or fattening bucket shops. A cynic once remarked that everyone must be "stung" at least once on oil stock.

### "Keeping Up with the Joneses"

There are many persons, especially in large cities, who always have lived beyond their means and always will. They are of the type which has striven to "keep up with the Joneses." They existed, nevertheless, before the automobile was born and they seldom pay bills until they have to.

It would be highly surprising, therefore, if a substantial fraction of the motor car users of the country were not persons who could not by any stretch of the imagination be considered able to afford them. No scheme has yet been devised, however, to keep a fool from soon parting

with his money. The partial payment plan has made it easy for them to buy motor cars just as it has diamonds or fur coats or expensive musical instruments.

Our only contention in this respect is that since there always have been and always will be numberless persons who fritter their earnings away on things they can't afford, the money might just as well go to the automotive industry as any other. The manufacture, sale and servicing of motor cars gives employment to more men than do most other industries. It adds just as much to the purchasing power of the country, it aids just as many other lines of trade, and it contributes just as greatly to general prosperity.

Each individual family must determine for itself whether it can afford to own a car. That is the inalienable prerogative of an American citizen.

### Deferred Payment Plan Sound

So much for those who buy cars when they can't afford them, on the installment plan or otherwise. Regardless of their foolishness, the fact remains that the sale and purchase of automobiles on the deferred payment plan has sound economic justification.

Primarily, of course, this system was devised to make the purchase of automobiles easier and thus increase the volume of sales. It is based, however, on the theory that it is more sensible to pay for relatively high priced commodities out of earnings than out of savings. It is an adaptation of the partial payment plan as applied to the purchase of a home or any other investment, although in many cases a motor car is not an investment in this sense.

Purchasing on this basis permits the use of the article desired long before it could be enjoyed if the full price were saved. It may be argued that it will be worn out by the time it is paid for, but even if this were true generally, which it isn't, what of it?

If it were a fact that motor cars were being bought by an excessively large number of persons who could not afford them, it would follow logically that the losses of finance companies from uncompleted payments would be very large, but such is not the case. From the time of its



organization in 1919 up to Sept. 30 last the General Motors Acceptance Corp. had done a total business of \$498,500,000 and its total loss had been 21/100 of 1 per cent. Other finance companies have had much the same experience.

Trying to answer the question of who can afford to buy a car is much like determining the replacement market from abstract considerations of the average life of a car. There is no accurate definition and none can be found which will stand the acid test of practical application. It would be just as easy to determine how many American women can afford to own fur coats. So many factors are involved that to attempt to enumerate them would be puerile.

Coming directly down to cases, the automotive industry does not contend that every person who buys a motor car is justified in doing so. It does insist, however, that the proportion is not large enough to spell disaster either for itself or the nation.

Time was, not so long ago, when bankers and some of the others who are bewailing the purchase of motor cars by so large a percentage of the American people contended that the automobile was a luxury to which only the rich were entitled. They strove their hardest to keep farmers and others from buying them. They refused to finance the purchase of them, either at wholesale or retail. Bankers have ceased, however, to let prejudice interfere with sound business.

Since facts and figures have been presented to demonstrate beyond cavil that the motor car is an absolute

essential to modern life and that most owners use them as vehicles of utility rather than pleasure, the luxury cry is not heard so often, but it sticks in the back of the heads of those who germinated it. The present propaganda against it is based on largely the same arguments. They have been shot full of holes so often that the entire industry is familiar with the facts. The extent to which cars are used for business is astounding.

The automotive industry has no grievance against any other industry or trade. If some of them suffer because of its success, it regrets this fact, but it does not propose to curtail its activities as a consequence. It is perfectly willing to concede that it has changed the buying habits of the nation to a considerable degree, but so have many other instruments of progress throughout the history of the world.

The automobile was an inevitable development of transportation. It supplied a need which had been felt for centuries. It has contributed fully as much as any other industry, with perhaps one or two exceptions, to the national wealth and it needs no justification.

When those interests which are bemoaning its amazing popularity are able to demonstrate beyond cavil that they are actuated solely by unselfish motives, the industry should pause and give earnest consideration to their claims for attention.

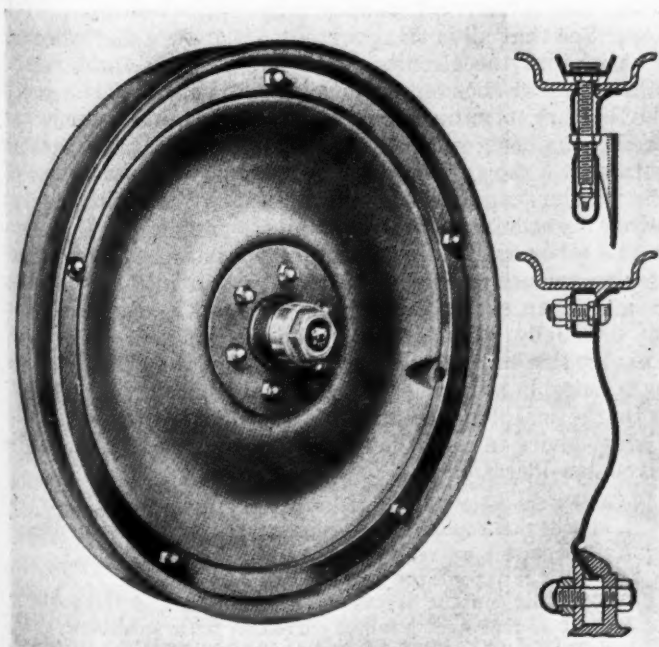
That day has not arrived, however, and it probably never will.

## Buffalo Small Diameter Wire and Disk Wheels

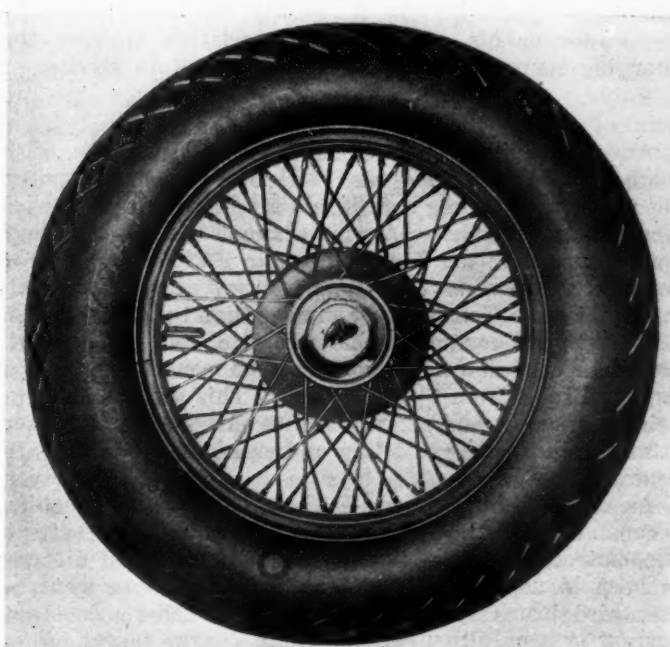
**S**MALL diameter wheels in both wire and disk types, to take care of balloon tires, are being offered to the industry by the Wire Wheel Corp. of America. These new products will be shown to the general public for the first time at the New York show.

The small diameter wire wheels incorporate Rudge-Whitworth, Houk and House patent features, such as triple lacing, engaging and locking details and barrel hub shells. The triple spoke feature allows for a special lacing to take care of brake torque.

The Buffalo disk wheel, brought out in standard sizes last year, has been refined. A straight valve stem is used, with a single disk that is claimed to be graceful in contour and to have no dirt pockets on either side. To remove a tire it is only necessary to loosen the nuts a few turns, whereupon tire, rim and clamping ring can be pulled out. All nuts and finished surfaces of the clamping ring are inside of the rim and are therefore protected against injury.



*Small diameter disk wheel*



*Small diameter wire wheel*

# Battery Life Depends Upon Proper Care and Service

Recent improvements in design have been discounted largely by use of smaller sizes by car manufacturers, says speaker at S. A. E. Metropolitan Section meeting. Units capable of service for five years can be built but usual average is under three.

**S**TORAGE batteries was the subject discussed by the Metropolitan Section of the S. A. E. at its meeting on Dec. 13. The paper of the evening was by T. R. Cook of the Westinghouse Union Battery Co. and representatives of other battery makers and users took part in the discussion.

The Metropolitan Section some time ago decided that, inasmuch as most of its members are connected more with the sale, service, operation and maintenance of automotive vehicles and equipment rather than with the manufacture thereof, it would be best to concentrate papers and discussions on these phases of automotive activity. Cook accordingly dealt more with the care and maintenance of batteries than with their design and manufacture. Following is an abstract of the paper:

With the generator input properly proportioned to the service required, a "healthy" storage battery will operate satisfactorily if attention is given to two things—filling with distilled water to keep the electrolyte above the plates, and cleaning of the battery of dirt and corrosion which may accumulate on top of it. In addition, the terminals should be removed occasionally so as to maintain a good contact, and they should then be covered with vaseline to preserve the contact.

The length of life of a battery depends upon four things: The design of the battery, its quality, the care given it by the owner or his agent, and the relation between the charging current and the current taken out in service.

## Small Batteries Common

An automobile battery can be built of such size, with plates of such thickness and with such spacing between them that with proper care it will give satisfactory service for four or five years. A good example of such a battery was that used on the Cadillac prior to 1920. However, for commercial reasons the batteries now furnished with automobiles are considerably smaller than that referred to. Car engineers consider it desirable to hold the weight, bulk and cost down to the minimum consistent with a battery life of from 1½ to 3 years. This smaller battery, being worked at higher rates of discharge, requires closer attention in the way of filling and cleaning, and also as to generator output.

As regards the charging equipment on the automobile, a constant potential equipment insures maximum battery life, but such equipments were high in cost and difficult to keep in adjustment, and engineers therefore went to the third brush system, which is essentially a constant current system, although the rate of charge tapers off as the speed of the car increases.

The charging current is calculated to take care of or-

dinary conditions of operation. Conditions vary widely, however, from those of a car used chiefly in touring and driven almost exclusively during daytime to those of a car used by a doctor who drives day and night and makes innumerable stops. Cook said he found that on a certain make of car the charging rate varied from 2 to 18 amperes in different machines, though undoubtedly intended to have an average value of about 7½ amperes.

## Must Meet Various Conditions

If a doctor happened to get into possession of the car with the 2-ampere charging rate he evidently would have to get his battery charged at a service station several times per month, whereas if the chronic tourist got hold of the car with the 18-ampere rate he undoubtedly would burn up the best of batteries in two or three months' service. It is evidently impossible to properly adjust the charging rate at the factory to meet all conditions, but if the battery on any car requires recharging this generally can be obviated in the future by adjusting the third brush to give an increased charging rate.

There are two other things to look out for, however. The ignition or the carburetor may be defective, and in consequence an excessive amount of current may be drawn from the battery at each start; or, again, there may be a partial ground in the circuits, resulting in current leakage from the battery. Leakages may be looked for as follows: See that all normal current outlets are disconnected, that is, that the circuits of all lamps, cigar lighters and other current consuming devices are opened. Then touch the battery terminal post with the terminal which has previously been removed from the post. If a spark is obtained it shows that there is leakage. Excessive use of the starter can be determined best by questioning the owner regarding his driving habits.

The other extreme condition of operation, where an excessive amount of charging current is put into the battery, results in an excessive loss of water and is evidenced also by unusually high gravity readings of the electrolyte. This trouble can be cured by decreasing the charging rate by a suitable adjustment of the third brush.

In the maintenance and inspection of batteries and in giving advice to car owners the following points should be given consideration:

1. Keep the electrolyte in the battery from ¼ to ¾ in. above the tops of the separators, filling with distilled water as required.
2. Keep the top of the battery dry and clean.
3. Keep the contact between the terminals and the posts tight and protect against corrosion with vaseline.
4. See that the generator delivers the proper charging current for the conditions under which the particular car is operated.



Cook also issued the following general cautions to battery or electrical service men:

1. See that no partial short circuits are developed in the car wiring as a result of chafing of insulation or other causes.
2. Keep the ignition system and the carbureter in proper condition and adjustment, to insure immediate starting of the engine.
3. See that the starter switch contacts are kept in good condition. Corroded or dirty contacts will add considerable to the resistance of the starter circuit, thereby lowering the speed of the starter, delaying the picking up of the engine and resulting in considerably more charge being drawn from the battery than would otherwise be the case.

If a battery fails to perform when it has proper care, Cook said, it is probably in need of the attention of a competent battery repairman, and when it comes to the purchase of a new battery the owner should be advised to get a battery of the largest capacity that can be put into the car and of the best quality.

Cook also spoke on standardization work in connection with batteries and battery containers. He said that six sizes of automobile batteries have been standardized and that they are now used by 80 per cent of all car makers, the remaining 20 per cent continuing to use bastard sizes. Efforts are now under way to standardize battery compartments of battery containers, and it probably will be recommended to car manufacturers to use a compartment capable of taking the next larger size of battery to that with which the car is actually fitted, so as to enable the user, if he so desires, to replace the original battery with a larger one.

Bruce Ford of the Electric Storage Battery Co., who opened the discussion, said he did not believe that overcharging burned out a battery. The only effect of continued charging after the battery was full was to cause rapid loss of water, and if the battery were properly filled no injurious effect would result. They had run tests at the factory in which a battery was subjected to continuous charge without any current being taken from it for a period which they figured corresponded to 50,000 miles of driving. Long life always indicates that the battery has been kept well charged, and it is the undercharge that gives trouble.

He also recommended that instructions be given to owners that the battery be filled with distilled water every so many miles, instead of at definite time intervals, because the loss of water depends largely upon the mileage. Instructions for renewing the oil supply in the crankcase were a good example to follow in this respect. He thinks that too much emphasis is given to the exhaustion of the battery by the starter and calculates that an average start requires only one ampere-hour, whereas the capacity of the average battery is 100 ampere-hours.

### Owners Ignorant of Battery Care

Walter E. Holland of the Philadelphia Storage Battery Co. said one difficulty the battery industry had to contend with was the general ignorance regarding batteries among those using them. He said a man some time ago bought A and B batteries for a radio set and after some weeks came back and complained that the batteries would not work—that they were dead. On investigation it was found that all that was the matter was that the batteries needed charging, and when the owner was told this his reply was, "How is that? I have a storage battery on my car and I never have to recharge it. In another case an owner was very careful to refill with distilled water, but unfortunately he found only one cell, the other openings

probably being somewhat less conspicuous. Holland also advocated the use of larger sizes of battery.

Attention was called in the discussion to the fact that so-called doped electrolytes are being sold all over the country, which are generally claimed to give new "pep" to a run-down battery. One of the schemes was recently exposed by the Vigilance Committee of the National Association of Advertising Clubs. The speaker said he had tested a considerable number of these electrolyte dopes and had found not one of them that had any value. They usually consisted of a somewhat concentrated acid solution, so if the old electrolyte were emptied out and the doped electrolyte substituted it would seem to tone up the battery, especially if the state of charge were low and the electrolyte therefore contained little acid.

H. M. Martin said that it was a wonder to him that the battery stood up at all under the conditions under which it had to work. The third brush system of control, he said, was not suitable, but some improvement had been made in it in recent years. In one instance a section of the field circuit was cut out when the lights are on.

### Third Brush System Adopted

A. D. T. Libbey said he agreed with Bruce Ford that undercharge was much more injurious than overcharge. One or two speakers had mentioned the desirability of the constant voltage charging system. There were two reasons why this system had been discarded in favor of the third brush system. One had to do with the patent situation, and he had told the warring parties at the time: "Gentlemen, while you are fighting the industry will go to the third brush system." The second reason was that the constant voltage system was more complicated and cost more money.

H. M. Crane said that when a battery was well made and of adequate size for the work it had to do, it would show long life. He knew of one 1915 car still in service but probably was about ready for the scrap heap, which, so far as the owner knew, who had bought it second hand, still carried the original battery. Another car of the same make bought in the fall of 1916 also still carried its original battery, and it had never even been repaired.

Crane also held that a battery could not be injured by excessive charging if it were kept filled with water. In summer, when the car is driven under such conditions that the amount of current consumed is small, the water should be replenished once a week. It is also essential that the battery be accessibly located.

In closing up the discussion and replying to questions, Cook said he would advise the use of constant voltage charging systems if they could be maintained without too much expense. He thought that battery capacity per pound of weight had increased from 15 to 20 per cent during the last five years, but that improvements in batteries were more than discounted by the car manufacturers using batteries of smaller size. As regards the decrease in capacity with drop in temperature, roughly speaking, at 0 deg. the capacity was only 50 per cent that at normal temperature.

It is the positive plate that suffers from buckling. Buckling is due to expansion, which in turn is due to chemical action and to heat. In some cases too much active material is put into the grid, which leads to buckling. Asked his opinion on jelly-filled batteries, Cook said these had been known to all the leading battery manufacturers for the past twenty years, yet none have adopted them. In automotive batteries the plates are placed very close together and all the available space is necessarily for acid. If from 20 to 30 per cent of this space were taken up by extraneous material the space available for the acid is that much reduced.

# Better Business in Petroleum Industry Predicted for Near Future

Optimism is general at American Petroleum Institute meeting. Fuel economy and engine performance, new uses for oil, and gasoline prices are topics discussed.

**A** GENERAL feeling that depression in the oil industry is nearing a close and that better times lie only a short distance ahead was evidenced at the fourth annual meeting of the American Petroleum Institute held in St. Louis, Dec. 11-13. Automotive fuel problems were discussed by Henry L. Horning, president, Waukesha Motor Co.; C. F. Kettering, president, General Motors Research Laboratory; Thomas Midgley, Jr., General Motors Research Laboratory, and G. K. Burgess, director, U. S. Bureau of Standards.

The sessions were well attended and a distinct note of optimism was heard from all branches of the business. The meetings were divided into general sessions devoted to broad problems of the industry and group sessions concerned with more technical questions such as standards, domestic oil-burners, fuel problems and drilling methods.

From the standpoint of the automotive industry, there were three subjects of outstanding interest which either were touched upon lightly or dealt with extensively by several speakers. These high spots were:

1. Changes in the price structure of crude petroleum and its products which are expected to come with the recovery of the oil industry to normal conditions of supply and demand.
2. Greater fuel economy and superior engine performance which may be realized in the future, this subject being developed by visiting members of the automotive industry.
3. Development and extension of new uses for fuel oil, distillate and kerosene, particularly in domestic heating, a line of growth that will require an increasing proportion of the components of crude petroleum now employed as raw material for cracking into gasoline.

## Fuel Test Conclusions Reached

Dr. H. C. Dickinson of the Bureau of Standards presented a report written by S. W. Sparrow covering work done at the bureau by the late Stephen M. Lee.

In this report, which deals with comparative tests of two grades of fuel termed B and D varying in end point and to some extent at intermediate points in the distillation, B being the more volatile, Sparrow reaches the following conclusions:

1. **Operation under constant speed and constant load.** In general, the same power and fuel economy are obtained with B and D fuels under warm conditions. Under cold conditions, particularly at low loads, the consumption of D fuel is greater than that of B, but not as much greater as the estimated possible production.
2. **Acceleration.** Under warm conditions very nearly the same rate of acceleration is obtained with D fuel as

with B. Under cold conditions more of D fuel is required for maximum acceleration than B. This will mean a higher mixture adjustment, causing an increased consumption of D, but not as much increased as the estimated possible production.

3. **Crankcase oil dilution** is greater with D fuel than with B.

## Relative Merits Judged

Final decision as to the relative merits of the two fuels hinges upon the evaluation of crankcase oil dilution. Even in the absence of proper carbureter adjustments with changes in air temperature it is probable that 15 per cent more miles per barrel of crude would be obtained with D fuel than with B.

If a 50 per cent increase in crankcase oil dilution represents an economic loss greater than a 15 per cent gain in mileage then the use of D fuel is undesirable, otherwise the reverse is true. This is the evidence, for the accumulation of which this investigation was initiated. Judgment as to the economic fuel rests with the industries concerned.

Dr. G. K. Burgess, Director of the Bureau of Standards, made an address in which he outlined briefly the relations between the bureau and the petroleum industry with which it cooperates in research and standardization work.

A. C. Bedford, chairman of the Board, Standard Oil Company of New Jersey, referred to the low petroleum prices now prevailing as follows:

"It is only fair to the public that we should make it clear to them that certain of the present conditions in the oil industry cannot continue. Speaking by and large, the oil industry today is selling its product at prices less than the actual cost of production. This is an impossible condition and can be the result of nothing but abnormal conditions. We must make it clear to the public that the industry cannot continue to give its services at prices prevailing today. Prices must move upward or a great part of the industry cannot exist."

The expected recovery of the oil industry was mentioned in an address by E. W. Marland, president of the Marland Oil Co., in these words:

"If the overproduction terminates in the early springtime, as now appears probable, and a heavy draft occurs on stocks as the summer progresses, the resulting decided advances in petroleum products prices will be received in a much more friendly attitude by the public, if it understands the true condition and the logic of such increase."

The plight of the gasoline manufacturer, as a result of overproduction this year, was described by George N.



Moore, president, Western Petroleum Refiners' Association, as follows:

"The refiner in 1923 did more business and made less money, if he made any at all, than in any year in his history. With an increase in the consumption of gasoline of more than 26 per cent, of lubricating oil of 15 per cent, of kerosene of 1 per cent and of refined fuel oil and gas oil of 11 per cent over the first ten months of last year, most of the refiners who buy crude oil in the open market have found themselves scraping the bottom of their cash registers and carrying heavy obligations with their bankers."

### Greater Gasoline Mileage Possible

Summing up his discussion of fuel economy, H. L. Horning said:

"It is possible to double the miles per gallon of gasoline on cars, trucks and in general by relatively small cost in design. In fact, when the public wants it, they can go 40 miles per gallon of gasoline on small cars."

"It is possible to treble the miles per gallon on lubricating oil; to save millions in field operation by use of modern types of automotive apparatus; and to increase vastly the use of petroleum fuel for house heating by a study of the technical side of the question and application of these studies to heating apparatus."

"It is possible to increase the sale of motor cars and gasoline by furnishing a winter grade of fuel."

"The happy and prosperous condition of the automotive industry is due to the willingness of automobile companies to reduce the unit sales price on their product with increasing production, thereby widening their market with each reduction in price. The automobile industry has decidedly increased its sales and added to its prosperity by furnishing the public a vehicle which meets the demands of weather and temperature."

"It is the hope of the automotive industry that economic policies which have guided it may find application in the petroleum business to the mutual benefit of both industries and greater service to the public."

C. F. Kettering, speaking at the annual dinner of the Institute, advised the petroleum industry to "sell" itself to the American public, implying that the industry was now suffering from misunderstanding and confusion on the part of the public.

Thomas Midgley, Jr., presented a paper on "The Progress of Anti-Knock Fuels," reviewing the development in respect to tetra-ethyl-lead already familiar to the readers of AUTOMOTIVE INDUSTRIES.

Considerable time and attention throughout the three days of the convention were devoted to the enlargement of the market for fuel oil, particularly through the development of domestic oil heating.

### Seek to Expand Markets

Henry L. Doherty, president, Henry L. Doherty & Co., delivered an address on "The Utilization of Petroleum Products," in which he urged that the petroleum industry rapidly develop the higher utility markets for fuel oil, such as that for home heating.

Papers which attracted wide interest were: "The Refiners' Problem in 1923" by George N. Moore and "The Hazards of Finding and Producing Crude Oil" by E. W. Marland.

Moore made a keen and searching analysis of the conditions which led to an overproduction of gasoline in the United States during 1923 and resulted in drastic declines in gasoline prices. He pointed out that:

"There was a struggle for crude oil in November and December, 1922. It was known that the light oil production of Mexico was falling off. It was true, how-

ever, that the increasing production of California was a menace, but its future effect was not fully appreciated at the time.

"Refiners' minds throughout the country were directed principally toward the acquisition of sufficient crude to meet an unprecedented but not accurately gaged demand for gasoline. The consequence was that there was a scramble for crude oil between hundreds of purchasers."

"It was at this time that the major purchasing companies changed their previous methods of buying oil, abandoned their flat prices for all grades and commenced to purchase oil on the basis of gravity. The psychological effect of this change and the resulting 'bullish' feeling which swept over the entire mid-continent field can hardly be overestimated in relation to its direct effect upon the subsequent movements of crude oil prices upward and downward, and upon the gasoline situation."

Marland's paper was among the ablest presented at the meeting and commanded wide attention and favorable comment. He said, in part:

"A formidable list of hazards could be cited in connection with producing oil, among them the hazards of fire, of water, lack of water, everything up to sudden death, but many of them are mere incidents of operation."

### Price Is Great Hazard

"The outstanding hazard is, of course, that of price. It is fundamental that an industry, to be and remain sound, must pay its way, together with a reasonable margin of profit. The great triumvirate of economic law—demand, supply and price—acting and reacting on each other, tend to bring about this condition."

"However, the migratory nature of oil itself, the subdivision of land into small parcels, and the fact that only by reducing to possession (producing it) can ownership in oil be created, all combine to prevent the law of supply and demand operating with the same degree of smoothness in the oil industry."

"The source of supply is directly governed by the accident of new pools and the rapidity with which such pools can be drained after discovery. Consequently, at all times, either an over-supply or a shortage threatens."

"Prices react readily to supply, although supply may not always react readily to price. As a result prices constantly move from one extreme to the other. Earning capacity disappears. Property values are wiped out. Bankruptcy faces the industry—many go down—then presto—change! and off we go on another mad whirl of prosperity."

"These rapidly changing conditions not alone disturb the capital that is invested in the industry but to an even greater extent work hardship upon labor employed."

"The secretary of the Institute has shown me an interesting and extremely significant set of figures compiled by the Institute. They show that more than half the oil produced in the United States today comes from less than 4000 wells, the other half from more than 281,000 wells. They show that half of today's production comes from highly flush wells whose decline will be very rapid."

"Through applying rates of decline which experience has taught are applicable, it means that the wells today producing approximately 2,200,000 barrels, will one year from today be producing not more than one-half that amount. It means that new wells must be drilled before that date which will produce on that date more than 1,000,000 barrels a day, for the consumption then will have increased to the amount of present production."

"Can you imagine sufficient new fields being brought in and developed, or extensions to old fields found, within one year, to equal the combined production of this group of record-breaking fields? I can not."

# How Qualities of Coated Automotive Fabrics Are Determined

## Part I

Purchaser can secure valuable information by employing simple apparatus. Some wearing characteristics are learned by use of scrub machine, which eliminates personal element of hand tests. Artificial aging gives useful data for comparative purposes.

By Ernest B. Bengert and N. M. Nickowitz

Respectively, Chemical Superintendent, Fabrikoid Division, and Chief Chemist, Fairfield Plant, E. I. du Pont de Nemours & Co.

USE of specifications in the purchase of all sorts of materials is a safeguard which large manufacturers have adopted very generally in this country. Purchasing departments are submitting lists of detailed characteristics and qualifications on which bids are to be based and testing laboratories are more and more examining goods received to determine whether the specifications drawn up are being met by the vendors.

No one questions that this sort of care in buying is good for both the suppliers and the consumers. It elevates the standard of manufacture, requires that the manufacturer shall become better acquainted with his own and competitive products, and assures the buyers that the supplier understands exactly what he wants and is supplying it to the best of his ability.

Intelligent specifications cannot be drawn up on the spur of the moment or by the mere decision to do so.

The knowledge required follows only after years of careful study of a product and the exact qualities of the product which fit best into the operations of the user. It is our intention in this article to try to acquaint the user with methods of testing employed by a large manufacturer of coated textiles.

The tests which we will describe are, perhaps, more thorough than any single user requires, but the reader will be able to pick out those tests which are of interest in his particular case and, perhaps after some laboratory work, will be able to adapt them exactly to his needs.

### Manufacturers' Tests Good for User Also

Tests here described were developed for the purpose of controlling accurately the quality of the goods made. The importance of uniformly high quality is paramount to most manufacturers, and his interest in this regard should be identical with that of the consumer. Manufacturers' tests, however, need to be more comprehensive than those employed by the user, because the manufacturer must make sure that his product fits fairly well to the use for which the goods are intended, and it is a fair assumption on the part of the buyer that no reputable manufacturer would, without protest, ship him goods which would not be suitable for his use. The frequent inability of the purchaser to specify exactly what he needs puts a greater responsibility on the manufacturer.

There are three general types of tests which are applied to coated textiles. First, those which might be more properly called observations, since they depend upon the senses, such as feeling, pliability, color, grain, lustre, etc. There are few accurate ways of carrying out and recording such observations. For the most part they are a matter of personal opinion, and perhaps it is not desirable that they should be reduced to an exact qualitative basis.

The second class of tests consists of observations made in the laboratory by use of machines which give definite, quantitative data on the property being tested. These tests are the ones upon which the manufacturer and purchaser must generally depend to determine and record the quality of the goods in question.

The third class of tests comprises those which depend upon actual service for determination of the desirability of the goods. Such tests, of course, are very slow and in general are not very useful in connection with purchase specifications.

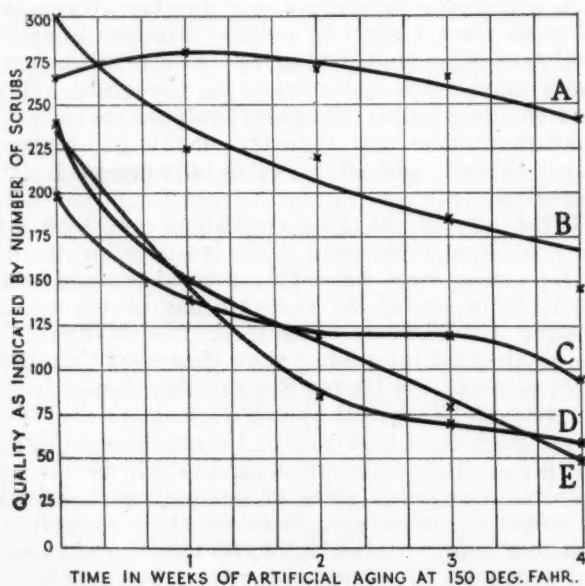


Fig. 1—Typical curves showing deterioration of various types of leather substitutes during artificial aging tests. Material B deteriorates rapidly and is much inferior to A at the end of a week though better at the start. This illustrates the importance of aging quality as contrasted to initial quality. Both materials have a normal or good resistance to deterioration. Curves C, D and E indicate relatively poor aging qualities.



**I**NTELLIGENT purchase of any commodity involves a knowledge of its quality. In modern industry, materials are being bought and sold more and more on the basis of specifications which define at least in approximate terms the qualities desired. There can be no exact standard of quality so long as it is determined by the personal judgment of individuals who themselves vary between wide limits. Consequently standard tests are needed by means of which quality can be determined with reasonable certainty.

To aid the industry in purchasing coated fabrics with better assurance of obtaining the quality desired, we have secured this outline of tests of such materials. The discussion is published in two parts, the first of which is given herewith. The authors have had many years of experience in coated fabric testing and manufacture and therefore are well qualified to speak with authority.

Part II, to be published in the near future, will outline further tests of importance and include typical specifications for both rubber and pyroxylin coated materials.

They should, however, be employed by every purchaser of coated cloth, because they show the relation between his laboratory tests and actual service. They will help him to revise his laboratory methods from time to time to predict more accurately the qualities which the goods will show in service.

**Scrub Test:** There are many classes and types of artificial leather and rubberized fabrics and it is difficult to discuss all of them with relation to a single test. Certain tests, however, can be applied to almost all classes of goods. The one which we consider the most important single test for pyroxylin coated fabrics or leather substitutes is the so-called "scrub" test.

This test is a very old one, having been applied by those familiar with artificial leather for many years. It was carried out originally by grasping a piece of the goods between the two hands so that the thumbs lie on top of the goods and parallel to each other and perhaps a half inch apart. The hands are then brought together, and by gripping the goods firmly it is scrubbed much as one might wash a fabric. The number of complete motions, that is, the number of motions forward and back, counted as one, before the coating breaks, is called the "scrub" of the piece in question.

This test, as described, gives very erratic results, as naturally would be expected. The strength of the hands and arms of individuals who carry out this test vary widely. It is known also that the same individual varies a great deal in the performance of the test on different days.

#### Scrub Machine Supplants Hand Scrubbing

It is obviously quite impossible to accept for the scrub of a piece of goods a single attempt to determine this quality in this way. This test, however, has been very useful and is still used to a certain extent. The modern successor of the hand scrub test is the scrubbing machine. General views of this machine are shown in accompanying cuts. It simulates the action of the hand scrub, but is much more accurate and can scrub 20 to 60 samples an hour, depending on the grade of goods.

The scrub machine has two heads in which the sample is clamped. The heads are reciprocated in opposite directions by cranks and connecting rods driven by an electric motor. The sample folds under a rider hinged to a bar which carries a weight at its outer end. The weight presses certain parts of the coated surface against adjoining parts of the same surface, while reciprocating of the heads stretches the fabric and causes the surface to be scrubbed together in much the same manner, but with far greater uniformity, than in hand scrub tests.

In selecting pieces for testing, one should avoid cutting pieces along the edge of the goods. Test samples should always be cut along the warp threads. The

piece is clamped firmly in position with the jaws in mid position. The weighted rider is then let down on the goods and the motor is started by the pull-chain switch. The machine is stopped as often as experience deems necessary and the piece is taken out and examined closely for a break in the coating. The frequency of examination will, of course, increase as the test progresses in order to secure an accurate end-point, the point at which the first break in the coating occurs. It is best to make duplicate scrubs.

#### Cause of Variations in Scrub Tests

Variation in the scrub of samples cut from a given piece of goods is sometimes as high as 25 per cent. This is not due to inaccuracies of the machine, but to variations in the fabric and to conditions in manufacture. Errors in the scrub are apt to be around 10 or 15 per cent on an average when two samples of the same materials are tested. In research work of an important character, as many as 50 or 100 samples should be tested in this way. The average figure obtained in this case is considered absolutely reliable.

Scrubbing machines are useful not only for determining the initial quality of the goods, but in connection with other tests. For instance, the sunlight exposure test and heat aging test are made very much more valuable by applying the scrub test to the goods which have been exposed.

Although the manufacturer of rubber coated fabrics does not rely on the scrub test to the same extent as the manufacturer of pyroxylin coated fabrics, it is an important measure of quality from both the producers' and purchasers' standpoint. The scrub test becomes especially valuable in connection with rubberized fabrics when made in conjunction with the physical tests described below.

**Physical Tests on Rubber:** In conjunction with the usual tests on the finished product, the manufacturer of rubber coated fabrics finds it desirable to make physical tests on the compounded rubber. The tests consist of determining the tensile strength, elongation, and set. The rubber is prepared for these tests by sheeting it out on a small experimental calender to a definite thickness. Test pieces are cut from these sheets by means of a die and the tensile strength, elongation and set determined by a tensile strength testing machine similar to that shown in Fig. 4.

#### Tests of Coating Important to Manufacturers

These tests are very important from the manufacturers' point of view, since they give him an absolute means of measuring the quality of the coating compound both before and after aging. It is not practical, of course, for the purchaser to make these tests and

perhaps just as well, since he can obtain a good idea of the quality from the scrub and other tests which will be explained below.

Besides testing the compound periodically in this manner, a manufacturer of rubber coated fabrics should never make a change in a compound without first determining its effect by the above means.

There probably is no reason why purchasers could not arrange to secure from the manufacturer specimens of the raw compound for physical tests if they desire it. The Government often follows this practice.

**Aging Tests:** Purchasing of coated textiles of all kinds up to the present time has been based far too much on appearance and price. When consideration has been given to quality, only the initial quality has been taken into account, as a rule. It probably is true that the importance of the initial quality has been overrated.

It is natural to assume that a piece of goods with a very high quality when freshly made will maintain a relatively high quality throughout its life. That this assumption is entirely unjustified, when comparing goods from different sources, will be shown later. A piece of goods, such as a high-grade upholstery material, can be made which has an initial scrub of 500, and would, at the end of a year of storage, have a scrub of 5 or 2, or even zero (that is, in the latter case, it would crack on bending). Obviously, this piece of goods is entirely unsuited for its intended use, although when new it was excellent.

### What Aging Tests Show

It is much better to have a medium initial quality with a low rate of deterioration. For instance, if a piece of goods scrubs 250 when fresh and then deteriorates to 50 per cent of its original value in a year, it will be useful and a quite satisfactory covering for a cushion at the end of that time and will promise several

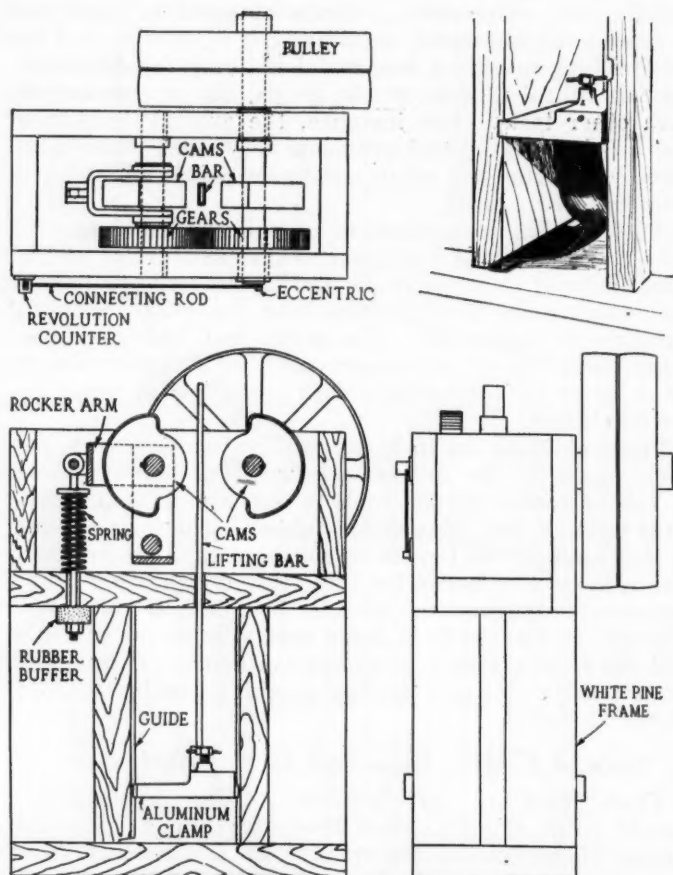
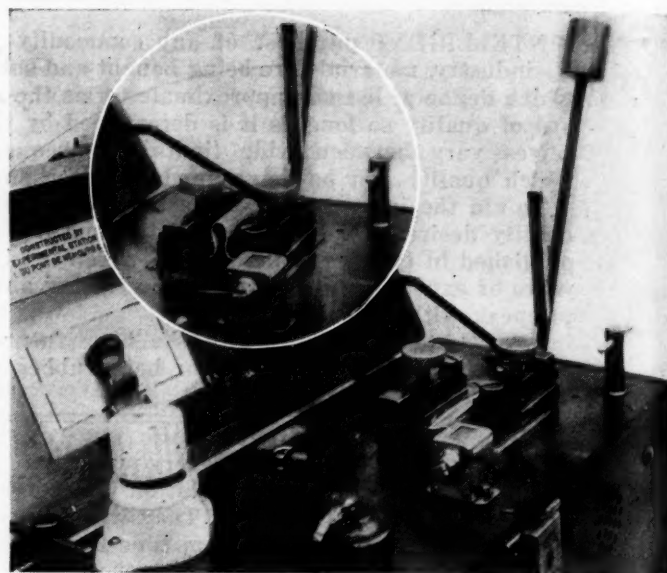


Fig. 2—Apparatus for determining ability of coated fabric to withstand repeated folding



View of scrub machine for testing leather substitutes. Note position of sample and how it is stretched when clamping heads are reciprocated

more years of good service. It is ideal, of course, to have a piece of goods with a high initial scrub and a low rate of deterioration, and this is the goal toward which all manufacturers of high-grade artificial leather are striving, with varying degrees of success.

Accelerated aging tests for pyroxylin coated material are best carried out by getting the initial scrub on a number of representative pieces and then storing these at 65 deg. C. (150 deg. Fahr.) in a carefully controlled electric oven, such as that shown in an accompanying cut. The goods are suspended so that there is a free circulation of air about them. They are removed once a week, pieces are cut off for scrubbing, and the remainder returned to the oven.

In this way we have at the end of four weeks of storage five scrub tests on each piece. It is common to express the result of this test in terms of percentage deterioration; thus, a piece of goods which scrubs 200 at the beginning and scrubs 100 at the end of the four weeks' storage test is said to have deteriorated 50 per cent.

Scrub test data can be plotted as shown in Fig. 1, and this is probably more enlightening than simply giving the final deterioration percentage. It will be noted that sometimes the scrub of pyroxylin coated goods is higher after one week's aging than it was when the sample was fresh (Curve A, Fig. 1). This is due to the fact that there are two influences at work during the early period of the aging of artificial leather. One which tends to improve the quality is the loss of residual volatile solvent. The other and opposite tendency is caused by the high temperature inducing decomposition of the ingredients of the coating.

### Deterioration During Aging

As long as the loss of solvent and concomitant toughening of the coating is in rapid progress, it overcomes the loss of quality due to deterioration, therefore quality, as measured by the scrub test, increases. Following this initial rise in quality there is a steady fall, which continues until the goods crack on sharp bending, at which time the scrub is said to be zero.

Progress of deterioration in different types of pyroxylin coated goods varies somewhat; for instance, the goods may become very oily, and this may be followed by stickiness. In other cases, the goods may lose considerable of their original pliability and finally be-



come extremely brittle. On the other hand, pliability may be retained to the end of the test, but the film may become "mushy" or soft and easily abraded. In the best type of leather substitute the surface characteristics never become objectionable until the coating has given years of satisfactory service. It is important, therefore, to make observations in respect to these conditions on the samples during the accelerated aging tests.

Four weeks of artificial aging, as described above, has been found to be equivalent to one year of storage.

It probably is true that the combination of the scrub test and the accelerated aging test gives the most important data which can be obtained for judging the quality of pyroxylin coated textiles that are to be subjected to hard usage.

### Aging of Rubber Coated Goods

Accelerated aging tests for rubber coated fabrics are carried out in much the same manner as those for pyroxylin material except that the material is stored at 70 deg C. (158 deg. Fahr.). On finished material, the following tests are made before storage: scrub, anchorage, and combining strength on double texture material. The last two tests are described later. In addition to these tests, some manufacturers make also physical tests on stored compound. These tests are made daily after four days' storage.

Rubber coated materials usually deteriorate in the following order: The varnish finish first begins to check after storage and this is followed by the rubber becoming

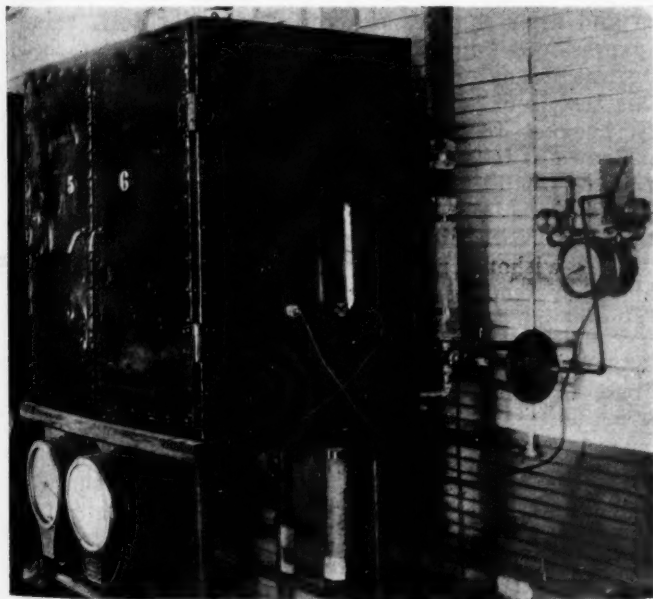
less and less elastic, until it finally cracks on sharp bending.

The effect of heat aging on rubber compounds has been well established by the work of Dr. W. C. Geer, who showed that subjecting samples to dry heat at 70 deg. C. (158 deg. Fahr.) for one day is equivalent to six months' normal aging.

For rubber the combination of tests a purchaser could make which would give the most important data would include, in addition to the scrub test and accelerated aging test, exposure tests, anchorage and combining tests. The anchorage and combining should, of course, be made before and after aging and exposure.

**Fold Test:** In Fig. 2 is shown an apparatus for carrying out what is called the fold test. This machine is operated by an electric motor and causes the goods to be stretched and folded sharply under a 10-lb. weight forty times per minute. The test is continued until the coating shows a distinct break at one of the folds, this being taken as the end point. Fold tests can be carried on also for a definite period of time, after which the goods are subjected to other tests to determine the effect of vigorous folding or creasing.

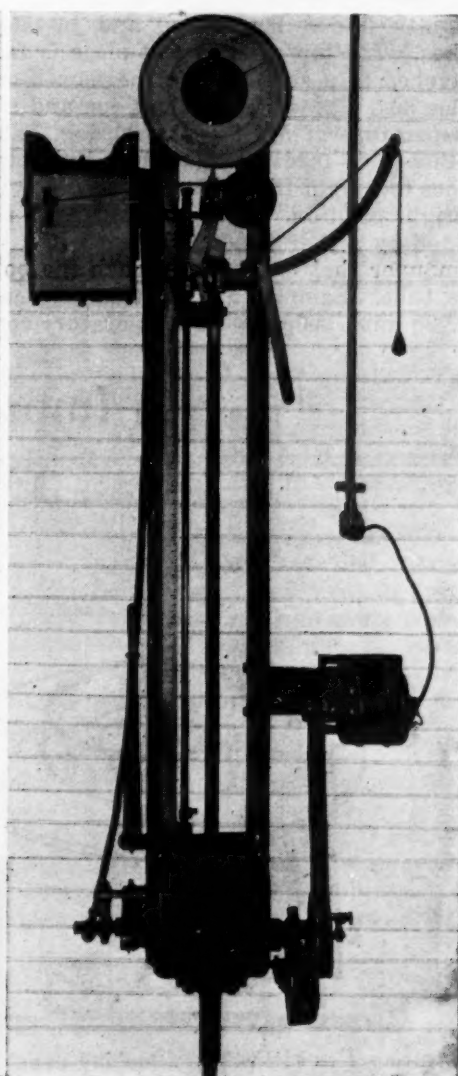
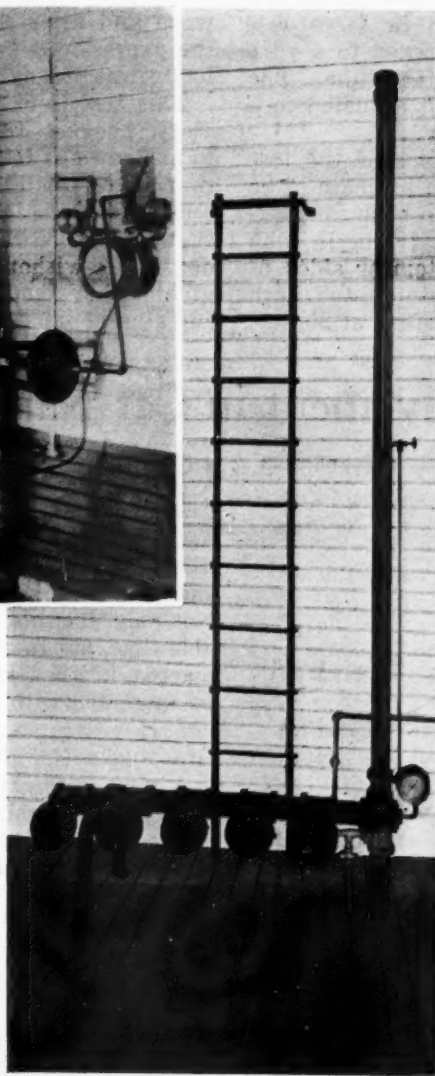
This test was designed primarily for automobile top materials, but it seldom is used for that purpose today, since collapsible tops are relatively fewer and are seldom let down. The test is especially useful for goods which must receive such action as that given by camera bellows. When used as an automobile top test, it is generally preceded and followed by the hydrostatic test, for much



Above—General view of constant temperature ovens for storing samples of leather substitutes during aging tests

Fig. 3 (center)—Apparatus used for determining relative waterproof characteristics of leather substitutes. It shows the hydrostatic head required to force water through the goods

Fig. 4 (at right)—Scott dynamometer or tensile strength testing machine used for obtaining tensile strength and tearing strength of fabrics, coated or uncoated, and strength of anchorage of coating to cloth base. Also used for measuring the strength of combining or resistance to separation of two fabrics in double texture materials



the same reason that the aging test is accompanied by the scrub test.

**Hydrostatic Test:** In Fig. 3 is shown equipment used for determining the hydrostatic resistance of coated fabrics. The material is tested in duplicate or triplicate by clamping pieces face inward over the flanges on the horizontal pipes which are connected with the vertical main. Water is fed into the vertical pipe at such a rate that the level rises at a rate of 2 ft. per minute. At the first appearance of water on the back of the fabric, which is outside, the water is shut off and the height of the column noted on the gage glass.

Any good top material will stand a hydrostatic pressure equivalent to 10 ft. of water for a long period of time without any leakage. If it stands this even momentarily, its hydrostatic resistance is satisfactory when new. After being subjected to the fold test for a reasonable number of times (say 300) it should stand a pressure equivalent to 2 ft. of water.

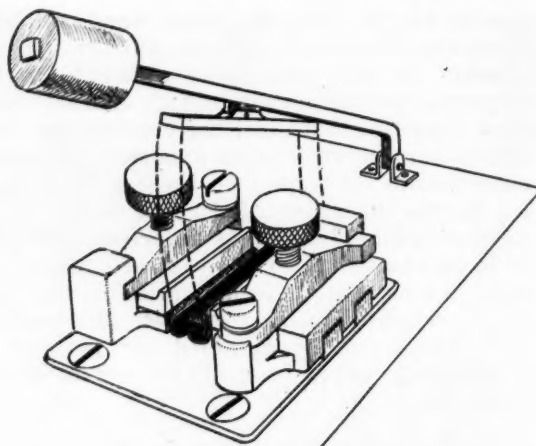
#### Shower Tests Too Gentle

The shower test, which has been employed by the Bureau of Standards, has been used to considerable extent, but it is so gentle in its action that it is useless as a test for waterproofness of top materials.

**Cold Crack Test:** This test is applicable to pyroxylin coated textiles, but not to rubber coated fabrics, as the latter are not affected appreciably in pliability by low temperatures.

Two test pieces, 1 in. wide by 7 in. long, are cut along the warp and two along the filler threads of the fabric backing of the material to be tested. These pieces are slightly folded lengthwise and inserted in large test tubes. The top of each test piece is fastened to a wire attached to a cork closing the mouth of the tube. The tubes are placed in a bath of ice and salt adjusted to a temperature of 6.7 deg. C. (20 deg. Fahr.).

Pieces of lead are placed in the bottoms of the test tubes to weight them down so that they will remain in an upright position. The temperature of the bath is determined by a thermometer inserted in a test tube in such a manner that it does not touch the bottom or sides of the tube. Samples are allowed to remain in the bath for 30 min., keeping the temperature constant at 20 deg.



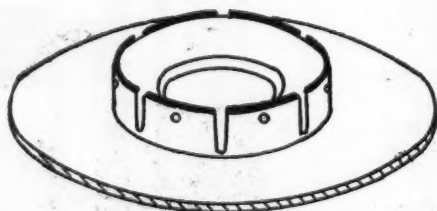
*Sketch showing how fabric is clamped and folded upon itself under the weighted rider of the scrub testing machine*

Fahr. by additions of warm water, or ice and salt, as required.

At the end of this time the sample is removed from its tube and quickly grasped in both hands, having a space of approximately 1 in. between the hands. The hands are pushed together, immediately causing several sharp folds in the test piece. The sample is then examined to see if the film cracked when folded. In some cases where the sample cracks badly a distinct snapping noise can be heard. The results of the tests on the warp and filler samples are reported separately, using the expressions "did not crack," "cracked," or "cracked badly," as the case may require.

This test is of particular value for automobile upholstery, because the material is certain to be subjected to extremes of temperature. It is well known, of course, that any artificial leather or coated leather cracks if the temperature is low enough. For use in a climate like that of New York City a coated fabric should stand 20 deg. Fahr. without cracking. Top materials might crack at a higher temperature and still be satisfactory, but curtains should not crack at 20 deg. Fahr.

## An Improvement in Car Name Plates



*Illustrating Fox method of attaching name plate to radiator*

ONE method of fastening the name plate of a car to the radiator that has been used in the past consists in providing the plate with a stud at the back, this stud passing through the radiator shell and being secured by a nut. This required securing the name plate to the radiator shell before the radiator core was put in place. Not only did this method of attachment require considerable time, but there was some risk of the name plate being marred in the assembling process, most of these plates being coated with vitreous enamel.

#### New Method Devised

A new method of attachment which seems to be a decided improvement over that just described has been evolved by the Gustave Fox Co. In the front of the radiator shell where the plate is to be attached is stamped a round hole of  $1\frac{1}{4}$  or  $1\frac{1}{2}$  in. diameter. The name plate is provided at its back with a cup-shaped steel spring, the flange of which is slotted. This spring is snapped into the hole in the radiator shell and the name plate is held securely in place by it. The new method permits of attaching the name plate just before the car leaves the factory and to save considerable time in assembly.





# The FORUM



## Present Balloon Tire Sizes Are Criticised

*British engineer says present "compromise standard" variety lack in stability because of narrow base and do not take full advantage of low inflation pressures. Can see no good reason for having two rim diameters in 6.70 in. size.*

Editor, AUTOMOTIVE INDUSTRIES:

Now that American "standard" balloon automobile tires have been agreed upon, it would appear to be a good time to analyze the standard and to offer constructive suggestions in reference to it.

Fig. 1 shows the new range of five balloon tires adopted. Three of them are for 21 in. rim diameter and two for 20 in. rim diameter.

Sectional diameters compared with "high-pressure" practice are as below:

3½ in. section becomes 4.40 in.

4 in. section  
becomes 5.25 in.

4½ in. section  
becomes 6.20 in.

5 in. section  
becomes 7.30 in.

This range is satisfactory as regards "standing diameters" unloaded, as these diameters correspond very closely to existing "high-pressure" practice.

This has been made possible by adopting two diameters of rim seat at the expense of interchangeability.

From the automobile engineer's standpoint this is a satisfactory solution of the standing height question which affects ground clearance and gear ratios.

**Absorbability**—While being very much better than is possible with normal "high-pressure" tires, is not increased as it might have been, if sections giving greater stability and at the same time lower inflation pressures had been adopted, without necessarily increasing the cost of equipment.

**Stability**—The arguments put forth in AUTOMOTIVE INDUSTRIES of Nov. 8 and exemplified in Fig. 2, page 950, have, so far as I am aware, been accepted by tire and automobile engineers in this country.\* Airplane tires and rims have the same ratio of rim to tire widths as are used in the drop-base balloon tire.

A close study of conditions obtaining in this Country

\*All references to this country refer to the United States. This letter was written just before the author sailed from New York, Dec. 13.

as regards the application of the balloon tire principle—in its best form to meet all conditions—goes far to show that the proposals put forward in AUTOMOTIVE INDUSTRIES of Nov. 8 (when modified in detail) present such decided advantages as to make them a better all-round standard than the "compromise" type now adopted.

Fig. 1 compares normal "high-pressure" tires with the compromise standard. By way of criticism the following would appear to be fair comment:

**Stability**—The whole range having narrow rims are lacking in this respect and will cause trouble and discomfort when driving:

1. At speed on all roads due to "snake-action" or "roll." This will be particularly marked on rough roads with heavier cars.
2. On corners when loaded and at speed.
3. When not inflated comparatively hard.

**Shimmying** of front wheels will occur on cambered roads and poor surfaces, due to the narrow rims causing a lateral displacement of the tread, leading to intermittent gather.

**Galloping** will occur due to the fact that narrow rims allow tires to "peel" over rim and cause a state of unrest due to insuffi-

cient base to tire. This does not occur with a wide base even without the use of shock absorbers.

**Inflation Pressure**—For a given vertical deflection, from 8 to 10 lb. per sq. in. more pressure is required in narrow-base balloon tires than in those having rims of normal proportions.

**Comfort**, the main object of the balloon tire, is jeopardized with the comparatively high pressures required.

**Puncturability**—Beyond question puncturability is increased with the higher pressures which are required in this type.

**Weight**—In the endeavor to keep weight down there has been a natural tendency to reduce rim widths. This can be done only at the expense of stability, higher inflation pressures and consequently comfort.

*So much interest was evinced in the article on proposed international balloon tire and rim standards which appeared in our issue of Nov. 8 that we asked Colin Macbeth, just before his return to England last week, to write a brief account of the conclusions he had reached as a result of a six-week study of the tire situation in this country.*

*The accompanying letter is a result of this request. Many readers may disagree with some of the statements made, but we believe that a careful perusal of these opinions will repay all those interested in this important and timely subject. Comments by readers who care to add to the discussion of the subject will be welcomed.*

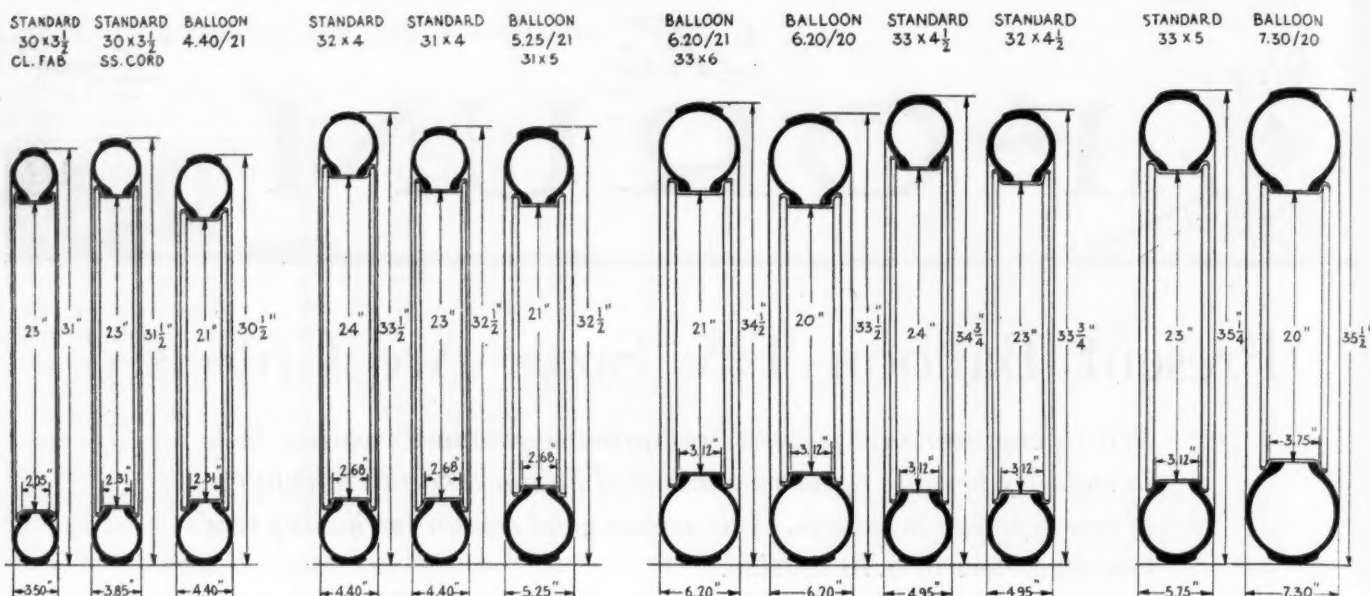


Fig. 1—Comparative sizes of various popular tires which have been "standard" for some time and the balloon tires recently adopted as "standard" by action of the Rubber Association of America

Criticising the range of standard balloon tires section by section the following points arise:

#### 4.40-In. Size:

This on 21-in. rim is now satisfactory as regards standing diameter, whereas it was too low on 20-in. rim.

The rim width of 2.31 in. is too narrow for stability. As an improvement widen the rim to 3 in. and obtain a stable tire of about 4.80 in. section without increased cost, but with about a 7-lb. reduction in pressure.

The section does not then take advantage of the large lateral clearance obtaining on small cars. To do so I would recommend a 5 1/4-in. tire on 20-in. rim; this will cost the same and have same weight but require lower inflation pressure and give greater stability.

#### 5.25-In. Size:

The same remarks apply here. In this case widening the rim to 3 1/2 in. gives a tire of about 5.85 in. section. This also fails to utilize the clearance available. As cars using the present 4-in. tires do not have big brake drums there is no obstacle to retaining the normal track.

A 6-in. tire with a 4 in. wide rim will weigh the same as a 5 1/4-in. tire and be able to run down to 15 or 20 lb. pressure at 18 to 20 per cent vertical displacement.

#### 6.20-In. Size:

There are two tires adopted for 20-in. and 21-in. rim diameters respectively. They vary only 1 in. in diameter or 3 per cent.

In place of these a tire of 6.70-in. section would have been a mean of the two, while departing only 1 1/2 per cent from the diameter of either. There appears to be no good reason for having two tires.

A rim width of 4 1/4 in. would give all the stability necessary for 6.70-in. tires.

The 6.20-in. size takes the place of the 4 1/2-in. high pressure tire and with this size using 20-in. rims interference with brake parts sometimes calls for a redesigning of same or an increase of track of wheels. Instead of increasing the track the seating width can be reduced, but this is not advisable.

In most cases balloon tires with 20-in. and 21-in. rims require some redesign of brake or wheel track. This being so and it being undesirable to have two diameters of same tire section, it would appear logical to use a 6.75-in. tire section and 4 1/4-in. rim width on 20-in. wheel. Such equipment would require only

about 18 to 22 lb. pressure to take 4 1/2-in. high pressure tire loads.

#### 7.30-In. Size:

This size tire needs good stability even more than the 6.20-in. size, as it is fitted invariably to large, heavy and fast cars. These have a long wheelbase and are very subject to the centrifugal action which causes rolling.

The consensus of opinion among automobile engineers appears to be that there is a crying need for a really "stable" balloon tire in the sizes substituting for 4 1/2 and 5-in. high pressure tires.

It is an interesting object lesson to fit a 7.30-in. balloon tire onto a rim of 4 1/4 in. width instead of on its 3.12-in. rim as used to date.

The result of doing this is to get a tire of 8 in. section at no extra cost, to insure stability and enable the use of inflation pressure as much as 10 lb. less, all by simply using the same tire with its beads wider apart.

Now, having criticised this range of tires adversely, let us see how the difficulties cited can be overcome:

1. Lack of stability. By using wider rims.
2. High pressures. By using wider rims.
3. Noninterchangeability. By making the two smaller tires have 20-in. wheel diameters.

To carry out this program entails:

- a. Making new rim rollings, these not being available in reasonable weights.
- b. Revising design of attachment of rim to wheel.
- c. Mould revisions in the case of 4.40-in. and 5.25-in. sizes.

If such a program were worked to we would have balloon straight side tires of good proportions which would be acceptable to automobile engineers, and provide maximum comfort features which the car user wants.

It would still provide tires having all the troubles now known to be inherent to straight side tires of the high pressure type as follows:

1. Heavy rims.
2. Flap troubles.
3. Water ingress troubles.
4. Costly rim and tire (flap).
5. Complexity as regards fitting and maintenance.

Having these points in mind let us now refer to Fig.



STANDARD 30 x 3 1/2  
CL. FAB. S.S. CORD

STANDARD 32 x 4  
STANDARD 31 x 4  
BALLOON 6.00 / 20  
32 x 5

STANDARD 33 x 4 1/2  
STANDARD 32 x 4 1/2  
BALLOON 6.75 / 20

STANDARD 35 x 5  
BALLOON 7.75 / 20

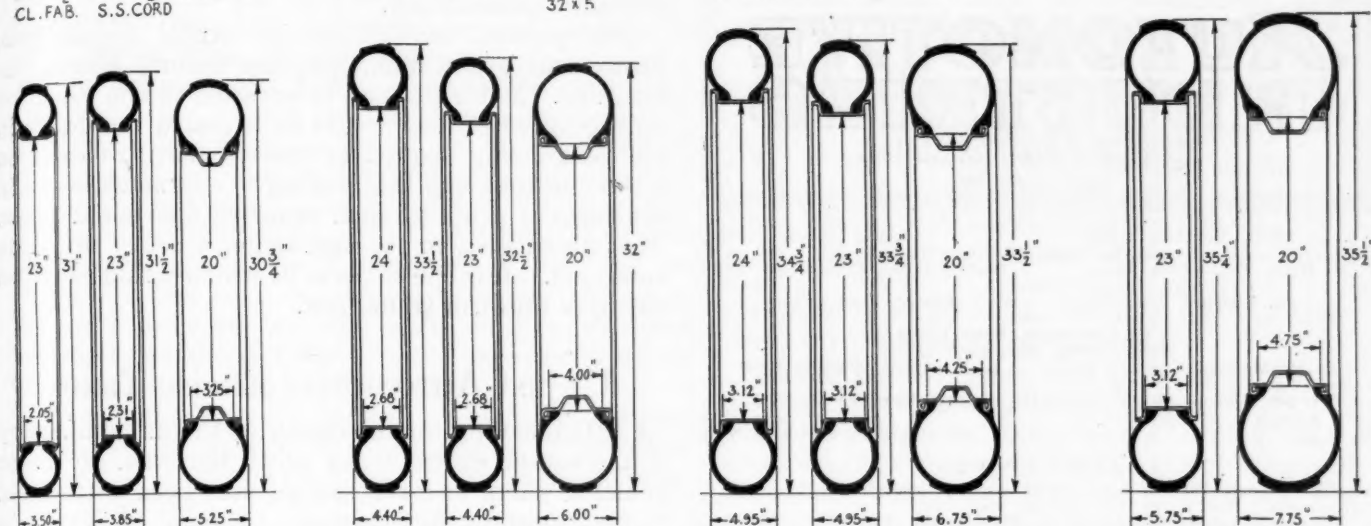


Fig. 2—Comparative sizes of various popular tires which have been "standard" for some time and the balloon tires on sunken base Dunlop rims advocated by Colin Macbeth

2, which shows a range of drop-base tires designed to meet the needs of service in this country:

- 3 1/2-in. becomes 5.25-in. on 20-in. rim.
- 4-in. becomes 6-in. on 20-in. rim.
- 4 1/2-in. becomes 6.75-in. on 20-in. rim.
- 5-in. becomes 7.75-in. on 20-in. rim.

Comparing these with the original proposals of Nov. 8, it is apparent that the three large sizes have been reduced in sectional size. This was advisable considering that the 34 x 4 1/2-in. and 35 x 5-in. tires are very seldom fitted today and therefore it was no longer advisable to make the diameters of these two substitute "balloons" to suit. In reducing sectional sizes rim widths have been reduced proportionately.

The advantages of this type of equipment remain as stated on Nov. 8.

By this time there has been an opportunity to demonstrate the special features of this equipment to tire manufacturers and automobile engineers. As a result of such demonstrations a number of the leading tire manufacturers have arranged to make experimental sets of tires. Also a number of the leading car manufacturers will test various types of wheel equipment fitted with these tires.

#### Car Designs May Be Altered

As regards equipment made to Figs. 1 and 2 note that certain makes of cars will require redesigning as regards axle parts and wheel housings. Also in some cars as regards wheel track. Also that the larger sections shown in Fig. 2 in conjunction with wide rims, greater stability and lower pressures will provide a more pneumatic range than in the case of tires shown in Fig. 1.

The object of these notes is to put before interested parties in the United States the merits of the drop-base full balloon tire as developed by Dunlop in England. In this way car and tire manufacturers and users can form their own conclusions by test as to whether this type forms an acceptable and preferable standard.

American-made equipment now in hand should within a short time prove this point and what, if any, modifications may be necessary to such a range as that shown in Fig. 2.

Summarizing the differences between the standard balloon and the Dunlop type in a few words, the following appears to meet the case:

Dunlop type has beads wide apart. This gives stability

and permits low inflation pressure as well as low cost and high capacity for section. Drop base rims give light weight with strength and low cost and are not easily damaged. They also make tires easy to fit.

COLIN MACBETH,

Experimental Engineer, Dunlop Rubber Co., England.

## Steering Gear Design Is Related to Balloon Tires

Editor, AUTOMOTIVE INDUSTRIES: Permit us to call your attention to the article by Mr. J. Edward Schipper regarding four wheel brakes on page 1049 of the Nov. 22 AUTOMOTIVE INDUSTRIES.

In the discussion of the steering problem and balloon tires, Mr. Schipper says that a greater reduction in steering is not to be desired, except possibly at the extreme ends of the steering wheel movement, and that one manufacturer, presumably ourselves, who has worked in conjunction with tire makers, is manufacturing a gear in which the reduction, due to cam action, becomes greater at the extremities than in the center position.

As a matter of fact, the exact reverse is correct. The reduction becomes less at the extremities than at the center of motion of the steering wheel in our steering gear. For instance, the steering gear we recommend on cars such as the Moon, Auburn, and others has 16:1 reduction in mid position and 7:1 reduction on either extreme.

In another article on the subject of four wheel brake adoption in England, your Mr. Bourdon on page 1057 makes the statement that worm and worm wheel steering still predominates and the cam type has lost ground.

We are sorry that this statement was made, because we have designated our steering gear as the Cam and Lever steering gear. Of course, our gear is built only in this country and the cam type gear referred to in Mr. Bourdon's article is evidently some other cam type, but we never heard of a cam type gear until we brought out our gear and we don't believe manufacturers in this country will associate the word "cam" in conjunction with a steering gear with any gear except ours and therefore will get the impression from reading this article that our Cam and Lever steering gear is losing ground, which of course is just exactly the reverse from what is actually happening. —Edward A. Ross, Secretary, Ross Gear & Tool Company.

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## THE CLASS JOURNAL COMPANY

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## Uniform Traffic Law Is Coming

**N**O one has been able to estimate up to this time how much of the highway traffic of the country is interstate in its character, but the percentage is steadily increasing. It certainly is large enough, and has been for a long time, to make ridiculous the lack of a uniform traffic code.

Automotive interests took the lead a few years ago in attempting to work out such a code, but they were unable to agree even among themselves upon all its provisions and the work was dropped, to all intents and purposes. It is highly gratifying, therefore, that the subject has been taken up by the American Association of State Highway Officials. A committee representing that organization will work out a code and after it has been accepted by the association will attempt to have it adopted by the State legislatures.

It is certain that unless the several States act with a reasonable degree of expedition, the Federal Government will do so for them because it can control interstate traffic.

Action by the States would be much more desirable, however, because State statutes would govern all highway traffic, thereby avoiding complications and inconvenience. Except for details, there would seem to be no insuperable obstacles against uniform State laws.

Certainly it should be easy to reach agreement on important fundamentals.

The present multiplicity of traffic regulations, State, county and municipal, has become almost unbearable. Motorists may be arrested in one town for not doing what they would be arrested for doing in the next town. No driver knows what to expect on a strange road and this has led to enormous levies in the form of graft by such expedients as speed traps. This constitutes, in the aggregate, a heavy tax upon motorists. It is one of the evils which would be wiped out by a uniform traffic law.

## Unjust Automotive Excise Taxes

**A** BILL calling for the repeal of the discriminatory Federal excise taxes upon the sale of motor vehicles, parts and accessories, has been introduced in the House by Representative Clancy of Detroit, a Democrat. The party affiliations of the bill's author should have no bearing on the situation, however, because the subject is wholly non-political. Practically all other war-born excise imposts have disappeared and Secretary of the Treasury Mellon is advocating the repeal of the remaining "nuisance" taxes, but he does not include automotive excise levies in this category.

No economic or moral justification can be found for assessing a special burden against a single great industry and the users of its products. Its only justification is expediency. This particular tax has been large in volume and easy to collect. The theory underlying its retention seems to have been that those who carry the burden are able to carry it.

There is scant likelihood, nevertheless, that these taxes will be repealed in their entirety at least. They may be lifted from replacement parts and accessories because in this respect they are a tax on misfortune and they may be removed from motor trucks, but there is little hope that passenger car purchasers will escape.

It will not be a waste of energy, however, to exert all the pressure possible upon Congress. The individuals in that deliberative body are highly sensitive just at present to political considerations and the motorists of the country cast 13,000,000 or 14,000,000 votes.

## Common Sense in Weight Limits

**N**O one has a keener common sense conception of the economics underlying improved highways than Thomas H. MacDonald, chief of the Bureau of Public Roads. He is looked upon, quite logically, as the leader of the movement in this country. While he views the subject with the interests of all taxpayers in mind, he is thoroughly convinced the motor vehicle will play an increasingly important part in the transportation history of the country. For that reason he does not believe in restrictions which will impair its usefulness.

The United States Senate committee on traffic conditions is trying to frame a model traffic law for the District of Columbia and it called MacDonald to give



his views on weight limitations for trucks. He asserted that there is no reason for a weight limitation of 28,000 lb. save seasonal conditions.

"Maximum weight is not so much the consideration," he said; "it is a question of how much weight is concentrated upon one wheel so far as its effect on the road structure is concerned. Given a plastic surface, it is a question of how much weight is concentrated per inch width of tire. So that if we regulate the wheel load to a maximum that is not too heavy for the road to bear structurally and then limit the pressure per inch width of tire, we have accomplished the purpose without necessarily fixing the maximum load to be moved at all."

"We ought to build roads," he added, "that are strong enough to hold up under just as heavy loads as ought to be moved from the standpoint of economy and no heavier."

This is perfectly good logic to which all automotive interests can subscribe.

### Crankcase Breathing Action

**E**NGINES in which the reciprocating parts are in inherent balance possess an advantage besides that of being relatively free from vibration—that their crankcases do not breathe in the same way as crankcases of engines not possessing this feature. The extreme case of an engine with unbalanced reciprocating parts is the single cylinder, in which the crankcase volume increases and decreases by the piston displacement volume once during each revolution. As a result, there is a constant inrush of air into and an outrush from the crankcase.

When the car is being driven on dry dirt roads this air will contain a considerable amount of dust. Now, the research work on air cleaners carried out at the University of California some time ago showed that the best way to retain dust carried by an air stream is to bring it in contact with oily surfaces, hence it is probable that of the dust entering the crankchamber with the air through the breather very little passes out the same way again.

In a four-cylinder engine there is still considerable of this breathing action, but in a six-cylinder, an eight-cylinder vertical with a properly arranged crankshaft and a twelve-cylinder Vee engine there is practically none. It is true that engines of this type also are commonly provided with openings in the crankcase, but these serve only as vents to keep the pressure within the crankcase at atmospheric. If no such vent were provided, leakage past the pistons would raise the pressure more or less above atmospheric, and there would then be a tendency to force the lubricating oil through the bearings and through any poorly fitted parts of the joints between the crankcase sections and between the crankcase and the cylinder block.

Therefore, in an engine with inherently balanced reciprocating parts practically no dust enters the crankcase directly, and this should tend to preserve the lubricating qualities of the oil and to reduce the wear on the working parts. For engines of this type some non-return form of valves on the crankcase is

evidently better than the conventional type of breather.

### Tire Industry Gets the Facts

**N**EARLY every week recently some new evidence has appeared of a determination on the part of the tire industry to find out the facts about its business. The latest move is being made by the National Tire Dealers' Association, which is instituting a monthly service to its members designed to show approximate retail stocks on hand and the trend of sales in various parts of the country.

Statistics along these lines are being collected by the association from its individual members. Compilations are to be made in the association headquarters and the results will be sent to the membership. The questionnaire on which the data will be gathered is to include number of tires and tubes on hand; percentage of increase or decrease of inventory over previous month; percentage of increase or decrease of sales and purchases over previous month.

The basic value of the figures collected will depend, of course, upon the ability of the association to get a sufficiently large number of complete returns from various parts of the country to make the reports true, representative of the retail tire field. The simplicity of the questionnaire and the obvious usefulness of the information, however, should be strong factors in making the effort successful.

The extension of manufacturing statistical data and the retail merchandising survey instituted by tire manufacturers are among the other progressive steps that have been taken. Collection and dissemination of facts of this kind will do more than anything else to provide a sound basis upon which to find solutions of tire distributing problems.

### Coordinating Transportation

**O**NE of the most significant moves yet made toward the coordination of new and old forms of transportation is seen in the announcement of the Pennsylvania Railroad that it has contracted with a motor truck corporation to handle short haul, i.e., freight in the densely populated territory between Philadelphia and Wilmington, Del. The immediate effect has been the abandonment of two daily freight trains between those points. The old rail rates will be charged for the new highway transport.

The Pennsylvania system is to be congratulated upon its willingness to accept without prejudice new conditions in the field of transportation. Its experiment in a thickly settled section will be watched with keen interest not only by other carriers but by all classes of shippers. Greater speed and flexibility of service undoubtedly will insure its success.

The Pennsylvania has been one of the pioneers in the use of motor vehicles as an auxiliary to rail service. The work it has done and will do in this direction will be of value not only to the other carriers but to shippers in general. General adoption of this supplementary service will come only after its value and efficiency have been thoroughly demonstrated in actual practice.

# TAX REPEAL BILLS AROUSE COUNTRY

## Congress Hears From Makers and Owners

### Hearings on Measures After Christmas Promised by Ways and Means Committee

WASHINGTON, Dec. 17—Legislation asking for the repeal of the excise taxes on automobiles, motorcycles, trucks, tires and accessories, introduced on Dec. 10 by Congressman R. H. Clancy (Dem.) of Michigan, has resulted in a deluge of proffered support of the measures.

Not only have members of the House Ways and Means Committee, to which the three measures were referred, received a volume of correspondence in regard to the measure, but an investigation shows that practically all Congressmen and Senators have heard from their constituency asking their support of the measure.

The letters are largely from automobile owners, declaring that they are of the belief that the emergency has passed where it is necessary for Congress to tax these essential commodities. Many of the letters are in a sarcastic vein, alluding to the Government's classification of the tax as "a luxury tax."

#### Farmer Denies Luxury Charge

A typical example of one from a West Virginia farmer to one of the members on the Committee is as follows:

"I've just bought my second flivver. I use it to haul garden truck, pigs and other live stock during the week, and we go to church in it on Sunday when the roads are not too muddy. I wish to God some of you aristocrats in Washington had to spend a week in my car, and I'd jolt the idea out of you that the use of my automobile is a luxury, on which I paid a \$34 luxury tax. I hope you repeal the measure."

A great many of the protests against the further collection of the excise taxes are voiced by automobile manufacturers and accessory makers. One of these was from Alfred H. Swayne, of the General Motors Corp., and representative on the National Industrial Conference Board and in the United States Chamber of Commerce.

In studying the question of repeal of the tax, Mr. Swayne has written the committee, sight should not be lost of the fact that in addition to the Federal excise taxes, automobile owners are burdened with State taxes of a great many varieties, as well as county taxes.

Similar endorsement of the tax revision idea and the Mellon program for tax reduction has been adopted by the Motor and Accessory Manufacturers' Association and forwarded to the secretary

## Business in Brief

NEW YORK, Dec. 17—Weather conditions remain largely responsible for retarding the sale of heavy goods at retail, but in general, activity in holiday lines makes up for the lack of seasonal stimulus. Department stores and mail order houses report heavy buying. The jobbing trade has tended to be fairly quiet, with indications of good volume of business in the offing.

Steel buying by automobile manufacturers, railroad interests and builders continues apace. Prices remain firm, and scrap material has been advanced. Production of steel ingots declined during the month of November, according to estimates of the American Iron and Steel Institute. Unfilled orders of the United States Steel Corp. showed a further reduction of 304,241 tons during the month of November.

Car loadings for the week ending Dec. 1 totaled 835,296 cars, a decrease of 154,921 cars from the previous week. This figure is some 6000 cars smaller than the total for the same week of last year.

During the week ending Dec. 1 the production of soft coal fell to 8,923,000 tons. This is a reduction of 12 per cent from the week previous. Anthracite production declined to 1,748,000 tons. Soft coal prices in the West have tended to harden.

Hog prices have declined under heavy marketing. Weather conditions have retarded the husking of corn, but abundant moisture has aided the winter wheat crop. Live stock, eggs and dairy products have declined in price.

Irregularity featured the movement of stock market prices. Wide fluctuations left a small net change. Operations were chiefly of a professional nature. European exchanges lost most of their early gains. Bonds were active, but showed irregularity.

by M. L. Heminway, general manager.

Many resolutions from civic organizations, commending the tax revision idea, have been received and promises made of their support.

Hearings on the measures have not as yet been called, but will be shortly after the Christmas recess, Chairman Green of the Committee on Ways and Means has promised.

## "Automobile Dollar" Now Worth 111 Cts.

### N. A. C. C. Compiles Statistics Comparing Present Value with Pre-War Days

NEW YORK, Dec. 19—Careful compilation of statistics has convinced the National Automobile Chamber of Commerce that the automobile dollar of today buys more than its pre-war brother. Investigation under the direction of General Manager Alfred Reeves has convinced him that the automobile dollar has gained several laps on the cost of living, that it now is worth \$1.11 as compared with 1913, whereas the cost of living has so increased that the dollar spent this way is worth only 61.3 against 100 cents before the war. The tire dollar is worth even more—\$1.23—while the gasoline dollar is valued at \$1.01, according to the statistics.

Results of this survey have been sent to the members of the Chamber by General Manager Reeves in the shape of a chart and a statement, which reads as follows:

#### Changes in Dollar Values

Based on the 1913 dollar as a standard, it is possible to get more automobile value for the money today than it was ten years ago. When one takes the average prices of automobiles, gasoline, and tires, it is found that these automotive products cost less today than before the war, even though the purchasing power of the dollar in general has shrunk considerably. Today one can purchase 111 cents worth of automobile, 101 cents worth of gasoline and 123 cents worth of tires with his 1913 dollar.

This fact, in the opinion of the National Automobile Chamber of Commerce, which has compiled figures from the records of various governmental and private statistical groups, is one important reason for the great activity in automobile buying.

Better highways and the general need for motor transportation account for a large share of the increase in motor vehicle registration, but this has been further augmented, the industry feels, by the fact that the public realizes that a dollar will buy more in motor products than in most other lines.

#### Cars and Tires Better

Furthermore, the current models of motor vehicles and the present type of tires are far better than ten years ago, even at the lower prices prevailing today.

The pre-war dollar is worth only 61 cents today in the general cost of living. It is worth but 51.8 cents in clothing, 68.5 cents in food and 61.2 cents in rent.

The automobile industry has met the problem of higher labor and taxation expenditure by the economies of large scale production.

(Continued on page 1284)



## Curtailment Expected Last Half of Month

Output Will Be Smaller Than in  
November, but It Will Exceed  
December, 1922

NEW YORK, Dec. 17—Schedules governing operations in major automobile producing plants showed no decline the first ten days of this month from the pace followed in similar periods in October and November. Curtailment is due to come the latter part of December, when some producers will either close their plants for a brief time or reduce programs materially, while inventory is being taken and manufacturing facilities readjusted.

### Affects Month's Total

This curtailment will affect the total production for the month but the output will be considerably greater than that reported in December of last year. Major factories are operating on programs far in advance of a year ago and are not likely to bring their schedules down to last year's level. This year Ford will shut down for only two days and is likely to report a total production of 150,000, with possibilities that the 160,000 figure will be reached. A million sales mark is the goal set by this company for the six months ending March 31.

Indications are that major producing plants will renew activities on high schedules the first of the year and, while many producers have announced programs for 1924 operations, definite figures for the majority will not be fixed until after the New York show in January. This show is regarded as a barometer of buying interest. Shows of minor importance that have already taken place throughout the country indicate that the spring, at least, of the coming year will find buying maintained at a high mark and not likely to fall short of the records established in the spring of 1923.

### Dealers Are Stocking

Shipments from factories to dealers are reported as being close to the high figures maintained during the year. There is an increasing tendency among dealers to stock cars against spring demand to forestall any shortage when the heaviest demand of the year comes. In some sections of the country, particularly in California and parts of the South, a scarcity of cars is evident, precluding the possibility of any accumulation of stocks there for some weeks to come.

## Color Feature of Next Year Probably Will Be Greater Use That Is Made of Combinations

AN INTERVIEW WITH E. R. HOAG,  
Vice-President and Sales Manager of the Ditzler Color Co.

By D. M. McDonald,  
Detroit News Representative of the Class Journal Co.

Detroit, Dec. 19.

**W**HETHER there is to be a greater use of color in the automotive production of 1924 is answered in the affirmative by E. R. Hoag, vice-president and sales manager of the Ditzler Color Co., not that there will be more or new colors introduced in the finishing of cars but that there will be a greater number of cars turned out in colors favorable for quantity production.

The practically exclusive use of black in the industry for many years is explained by Mr. Hoag as caused by difficulties experienced in using other colors in quantity output. With the advance in the art of paint preparation it has been possible to create other colors which will stand the test of production work, and there will be greater use of these established colors than ever before. As used now in most of the larger car producing companies several varieties of colors are giving just as complete satisfaction as black.

The appeal to the eye of the prospective automobile buyer is becoming more and more the most important item of merchandising, Mr. Hoag said, and he backed this opinion by the experiences in recent years of several of the large companies. Making this appeal is not by any means entirely a matter of finish, he declared, but the paint work that blends with and sets off the lines of the car performs a very important function.

In the exhibits at the forthcoming shows there probably will be fewer colors shown than formerly, Mr. Hoag states, but there will be greater use of the several colors which have been established for automobile work. This will require manufacturers who seek individuality in their paint work, to seek combinations of these colors which will individualize their products. The greater use of combinations will probably be the color feature of the year, he said, with manufacturers giving far more attention to this formerly incidental detail. Use of stripes in conjunction with color combinations also affords opportunity for individuality which probably will be used more than heretofore.

Aside from the fact that manufacturers are producing more new cars in colors than ever before, the desire on the part of the public for cars with special paint treatment is exhibited in the trend of repaint work throughout the country. It is the exception that a car is refinished for an owner in black. When he has his car painted himself, the average owner for the first time has an opportunity to express his individual color preference, and the result is almost universally a departure from the original color.

Car manufacturers are creating unconsciously the color styles of the year by the models which they bring out, said Mr. Hoag. The appearance of a new model in a color which proves popular finds many owners copying after them when they determine to repaint their car. For this reason paint manufacturers find it necessary to issue yearly revised paint charts showing the trade names of the standard colors being used by each car manufacturer each year.

Owners as a class have never given serious attention to keeping the appearance of their car up to the mark that would ordinarily be expected, and repainting has been neglected almost entirely. This is ascribed by Mr. Hoag to the prevailing custom of trading a car in on a new one when the owner becomes dissatisfied with its appearance, rather than go to the expense of having it refinished.

Changing conditions in the used car field may require the retention of cars by original owners for longer periods than has formerly been the case, and should this become the fact there is certain to be much greater demand for repainting than formerly. In Mr. Hoag's opinion the used car would be much more readily marketed if some attempt were made to paint it in the prevailing popular colors, and he believes dealers could make the additional cost of painting pay by the higher prices obtainable.

An encouraging tone is given to truck operations, due to the fact that at least one large manufacturer has returned to production after a period of idleness in which manufactured goods were being cleared. As a general rule, however, inventories of finished trucks have been kept at a low point. The market is somewhat slow, but manufacturers are doing a margin of business at the present time which

keeps them on the right side of the ledger, a position they fully expect to hold.

Tire makers show improved conditions, with inventories being reduced and shipments increasing. The parts branch of the industry shows activity in keeping with the operations in car and truck plants. Sales are good and collections continue satisfactory.

## Ford Man Looks for Preferential Tariff

Canada, Australia and South Africa Interested, W. R. Campbell, Reports

DETROIT, Dec. 17—Probable establishment of preferential tariffs between Canada and Australia and South Africa is looked for in the near future by Wallace R. Campbell, vice-president and treasurer of Ford Motor Co. of Canada, Ltd., who returned this week from England, where he met by appointment Premier Bruce of Australia and Premier Smuts of South Africa, while these latter were attending the Imperial Conference.

Campbell declared both premiers are Empire men who are doing all possible to keep the trade of Britain and British possessions within the limits of the Empire and to the special advantage of each part of the Empire. Premier Bruce will visit Canada on his return to the Antipodes, Campbell said, at which time he will take up with the Canadian government the subject of establishing a preferential tariff between Canada and Australia.

Canadian export business of all kinds will be stimulated as a result of the Imperial Conference, Campbell said, though he declared he was not privileged at this time to comment very much on the interviews he had or on the specific effects of the Conference.

While abroad Campbell spent some time in war areas of France and Belgium and also visited Scotland. Of unemployment in England, he said he noted that there was still considerable, but believed much of it to be due to the elections then approaching. The dole system, he said, is furnishing worse conditions of unemployment. Reconstruction is going forward rapidly in the war areas, he declared.

## New Company Organized to Make Fabric Bodies

DETROIT, Dec. 17—The Fabric Body Corp. has been formed to operate as sole licensee in promoting the building of fabric bodies in the United States and Canada and has opened offices and show rooms at 5940 Cass Avenue, this city. Kenneth L. Childs, originator of this type of automobile body, has been elected to the presidency. He also is consulting engineer of the Standard Textile Products Co., which has developed in its Meritas leather cloth a two-ply material adapted to the outer covering of fabric bodies.

Four Meritas-made fabric bodies built on the Childs system will be exhibited in the Commodore Hotel during the New York show—one a Packard sedan which has had 20,000 miles of rough going, one a custom job on a Lincoln chassis and the other two developments in custom type bodies on Ford and Dodge chassis.

## MINNESOTA VISITED BY 700,000 TOURISTS

MINNEAPOLIS, Dec. 17—More than 700,000 automobile tourists visited the State and nearly \$40,000,000 was spent by them in Minnesota in 1923. This is the report of Secretary H. C. Hotelling of the Ten Thousand Lakes Association of Minnesota. Sixty-nine per cent of State resorts had to turn away travelers for lack of accommodations.

In the 1923 season the Minneapolis Minnehaha tourist camp took care of 3,638 automobiles carrying 13,095 persons. This was a gain of 100 per cent over 1922. Iowa was best represented and August was the banner month. On September 4, 215 cars were in an enclosure made for 110 cars.

Figuring 3.06 persons to a car, St. Paul's Cherokee Heights camp entertained 11,382 automobile tourists in 1923. The total was 3,723 cars. The camp capacity is eighty cars and many times was all taken.

## New York Car Sales Fall Off in November

NEW YORK, Dec. 17—November registrations of new cars in this city showed a decrease of approximately 30 per cent from October among all prices of cars, but the decrease was slightly greater among high priced cars, according to the Automobile Sales Analysis published by Sherlock & Arnold.

Total registrations for the eleven months of the year in the low and medium priced lines are 76,200, as against 62,301 in the same period in 1922 and 41,732 in the eleven months of 1921, showing a healthy growth.

In the high priced line registrations for the first eleven months aggregate 7888, as against 6758 for that period last year and 4359 in 1921.

Registrations in excess of 10,000 are still limited to two cars in the low and medium price line; three others are greater than 4000; fourteen are more than 1000; eight have more than 500 registrations and nineteen have between 100 and 500.

Recapitulation by months for this year as recorded by the Automobile Sales Analysis is as follows:

|                 | Medium and Low Priced | High Priced |
|-----------------|-----------------------|-------------|
| January .....   | 2,803                 | 212         |
| February .....  | 2,775                 | 606         |
| March .....     | 8,050                 | 821         |
| April .....     | 11,050                | 1,130       |
| May .....       | 11,220                | 1,059       |
| June .....      | 9,699                 | 815         |
| July .....      | 9,127                 | 760         |
| August .....    | 6,458                 | 542         |
| September ..... | 5,430                 | 553         |
| October .....   | 5,572                 | 801         |
| November .....  | 4,016                 | 539         |
|                 | 76,200                | 7,888       |

## Ticker Will Quote Prices on Used Cars

Detroit Sales Managers Seek Way to Keep in Touch with Their Market

DETROIT, Dec. 17—Ticker service recording sales prices and quotations on used cars is being seriously considered by the Detroit Automobile Sales Managers Association as a means of keeping every retail salesroom in the city in immediate touch with the used car market. The main purpose of the service would be to keep sales managers informed on appraisals in much the same manner that quotations on stock prices are given.

Whether the ticker service or some form of it is actually put into operation, sales managers are determined through their association to keep in immediate touch with the used car market. High appraisals brought about through companies competing against reported appraisals of others are to be ended, if it is possible to end it. As an immediate result of the formation of the association sales managers are in a position to consult with each other on appraisals and get the "low down" on them.

### Comparison of Prices

As a feature of the December meeting of the association, twenty-six members attending were requested to submit allowances that they would make today on six hypothetical open cars of different makes in specified condition. The makes selected were Buick, Studebaker, Dodge, Overland, Chevrolet and Ford. The cars were of different years. Averages were then struck, the high and low prices shown and the forms returned to each member with these results attached to their own estimates.

Results of the questionnaire were as follows:

| Make             | average | high  | low   |
|------------------|---------|-------|-------|
| Buick .....      | \$582   | \$750 | \$350 |
| Studebaker ..... | 577     | 650   | 350   |
| Dodge .....      | 423     | 575   | 300   |
| Chevrolet .....  | 285     | 350   | 100   |
| Overland .....   | 288     | 365   | 100   |
| Ford .....       | 230     | 275   | 175   |

Reasons why there should be differentials in appraisal such as shown were then discussed. Each member was asked how he had figured on necessary reconditioning. Experiences were exchanged. High appraisals were shown mostly where the sale involved a high priced car purchase, and low appraisals the reverse. In all cases it was agreed the resale would have to be at market price far below the average set up. By keeping the market price definitely in mind, it was agreed, members could do much to eliminate losses.

It was the opinion of the meeting that it was ridiculous to hold over used cars until spring in expectation of selling

(Continued on page 1286)



## Transportation Men Hear Walter C. White

### Truck Maker Addresses Traffic Club of New England on Com- petition Among Carriers

BOSTON, Dec. 17—President Walter C. White of the White Co., Cleveland, in an address at the annual meeting and dinner of the Traffic Club of New England, at which more than 250 men comprising railroad, electric and water transportation lines touched elbows with truck owners, punctured a lot of the fallacies about commercial vehicles and buses destroying railroad and electric railway companies through competition.

Mr. White showed by facts and figures how the motor truck is paying its way. He proved that when all angles of finance were investigated, the motor people as a unit paid more than either the steam or electric lines for taxes. If anyone present harbored the idea that States have subsidized the truck through building highways, Mr. White eradicated that completely.

When it came to a question of competition, he read statistics from Connecticut, where a traffic census was taken, which showed that of various commodities handled by railroads but 2 per cent of them were being carried by trucks.

#### Road Policy Defined

On the question of highway maintenance, Mr. White outlined what the motor industry, through its affiliated bodies, stood for now. These organizations have gone on record that road building is a capital investment by the State, and, therefore, should be paid for under the general tax levy by all the people. But the interest on this should be paid by the motor industry through its users for highway maintenance.

In the matter of regulation Mr. White said the National Automobile Chamber of Commerce believes that there should be some sort of regulation through a fair State body. He did not say specifically that all motor vehicles carrying freight and passengers should be under Public Utilities Commissions in every State.

One interesting fact was brought out by Mr. White that is worthy of consideration by railroad and street railway men. He stated that engineers of such lines that go to him and say they are going to operate bus lines, but they know they will not pay, should go into the facts of bus operation before talking that way.

Mr. White pointed out that few of the many bus owners who bought their vehicles on time payments were forced to let the makers repossess the trucks. That proved, he showed, there was a demand for bus transportation when men could pay 25 per cent down and the rest within a year.

He stated that the financial figures showing taxes and operative costs when analyzed prove that motor trucks are

paying as much, if not more, as a unit than steam or electric lines. And that being so he emphasized the fact that the rail lines have a monopoly of the right of way, but the trucks have no monopoly of the public highways, for truck owners cannot use the rail tracks, but railway operators may use the highways.

On the other hand, he told of companies that operated de luxe bus lines parallel with their own lines, and were making money with the buses without cutting into the street car receipts. To him it seemed to be a matter of going at the matter intelligently. If there was not a demand for truck and bus transportation, the business would never have shown such increases as figures imply, was his answer to those who argue there is too much competition.

Mr. White sounded a note of warning to all men engaged in the transportation business when he told them that if the States overburden the truck through excessive taxation, which is passed along to the shipper in higher rates, and thereby militate against sales through too high prices, the makers of various commodities will go into the market and buy trucks themselves, a step which many believe would bring about private ownership, over which State Public Utility Boards would have no control.

### Chicago Police Fleet Increased by 20 Cars

CHICAGO, Dec. 17—One automobile with a crew of five men is the equivalent of 100 patrolmen in combatting criminals, according to Mayor Dever of Chicago, who last week told the local American Legion how the city police department is using motor cars as an aid in law enforcement.

The mayor said the city council has recently provided the police department with twenty powerful automobiles, which will be kept constantly in service with a crew of picked officers in charge of each. These cars are to be always within call of headquarters.

"Gasoline has helped the criminal; now we're making it help the policeman," the mayor said.

### Weidely Plant Sale Scheduled for Jan. 15

INDIANAPOLIS, Dec. 17—Court orders issued here Saturday announce the proposed sale of Weidely Motors Co. assets Jan. 15. The concern has been in the hands of a friendly receiver since August, when sudden action by companies purchasing engines from the concern stopped further acceptance on contracts until motor car demands increased. William H. Fletcher, former secretary, was appointed receiver by the court.

It is understood that a plan of reorganization has been perfected by officers of the company and that it will be purchased at the receiver's sale by a committee of the present owners under the court orders. The sale will be at public auction to the highest bidder.

## Model Union Station for Buses Discussed

### Senate Traffic Committee Suggests That One Be Established in Washington, D. C.

WASHINGTON, Dec. 18—The establishment of a model union bus station in this city will be taken up at a conference called for Thursday of this week by the Merchants and Manufacturers Association, acting at the suggestion of the Senate Traffic Committee, now investigating a model traffic system for the nation's capital—one that can be patterned after by other cities.

There are sixteen bus lines operating out of the city, each with a different terminal and without necessary bus facilities. The bus line must be recognized as a necessary integral part of the future transportation system of the country, the Senate committee has declared, and steps should be taken to make it as efficient as possible.

The establishment of a union station, with ample waiting rooms, ticket offices and other necessary facilities, the committee suggests, will improve service, mean a saving in operating expenses and a great deal of difficulty on the part of patrons in going from one station to another.

Invitations have been sent to owners of each of the bus lines to participate in the conference, and the board of governors of the association will lend its efforts in the drafting of the necessary regulations which will be duly presented to Congress for incorporation in the future model traffic law.

### Southeast Reports Tractor Sales Brisk

ATLANTA, GA., Dec. 18—Reports to the Federal Reserve Bank of Atlanta by the seven larger jobbers of tractors and farm implements in the Southeast show a marked increase over sales volume at this time last year, the exact percentage of the increase being 21.5 per cent for these seven distributors.

As compared with early fall, sales are holding to the same basis, an unusual circumstance, for sales ordinarily experience a considerable decline the last two months of the year. With cotton prices above 35 cents, the outlook from now until early spring virtually assures the largest tractor and implement business in the history of the South.

#### STRANAHAN'S MEN MEET

TOLEDO, Dec. 17—Sales of the Champion Spark Plug Co. are approaching a record of \$35,000,000 gross this year, according to an announcement made by President Robert Stranahan to salesmen of the company here for the annual conference last week. The men visited the local plant on Tuesday and the branch factory at Detroit on Wednesday.

## Relief for St. Louis Lies in City Garages

**Committee Would Spend \$8,240,000 for Six Buildings to Help Traffic Situation**

ST. LOUIS, Dec. 18—A special committee of the St. Louis Chamber of Commerce appointed to investigate and formulate plans for the relief of traffic congestion, has recommended the building of six municipally owned garages, each 200 feet square and six stories high, at a total cost of \$8,240,000, and the building of subways as a solution of the downtown parking problem.

The plan as contained in the report contemplates the payment of twenty-five cents a day per car to provide revenue for the retirement of forty-year bonds with which the project would be financed, after which the city would own the buildings and land.

A survey has shown that an average of 22,000 vehicles enter the central business district daily, of which 12,000 are automobiles and the committee estimates that cars requiring half day and all day storage in this district number 5500. Buildings such as recommended would provide space for 6000 automobiles, thus relieving the streets of this number.

The committee believes that congestion from parked automobiles causes delay to commerce at great financial loss. Subways for street cars also are recommended as necessary for the proper solution of the problem.

## W. P. Chrysler Assumes Maxwell Presidency

DETROIT, Dec. 20—Walter P. Chrysler has quietly assumed the presidency of the Maxwell Motors Corp., succeeding W. R. Wilson, but no formal announcement of this step will be made. A large part of the administration work of the company will devolve upon the vice-presidents, for which they are well qualified.

Announcement also is made that the new car which Chrysler has been working on for some time, and which will make its debut next week, will not be part of the Chalmers line as rumored, but will be made by an associate company of the Maxwell Motor Corp. and the Chalmers Motor Car Corp.

## J. D. Mooney to Talk to Export Managers

NEW YORK, Dec. 19—The program for the export managers' convention, which will be held Jan. 9 at N. A. C. C. headquarters under the auspices of the Foreign Trade Committee of the National Automobile Chamber of Commerce, of which John N. Willys is chairman, has been arranged. One speaker announced now is J. D. Mooney, president of the General Motors Export Co., whose

address will be "Automotive Observations in Australia, New Zealand and India." There will be five other speakers not yet announced, the subjects selected being: "Little Known Facts About the European Situation," "What Is Expected of the American Manufacturer if Export Financing Facilities Are to Be Expanded," "The Bearing of American Investments Abroad on Automotive Export Sales" and "Direct and Indirect Automotive Advertising Abroad."

In addition, P. J. Stevenson, trade commissioner of the United States Bureau of Foreign and Domestic Commerce, will deliver a talk illustrated with slides on "Pictorial Review of South African Automotive Market."

## C. M. Schwab to Speak at N. A. C. C.'s Big Dinner

NEW YORK, Dec. 18—Charles M. Schwab, now a member of the automotive industry through his ownership of the Stutz Motor Car Co. of America, will be the principal speaker at the annual banquet of the National Automobile Chamber of Commerce, which will be held at the Commodore Hotel, Tuesday, Jan. 8. Dr. Edward Cattell, city statistician of Philadelphia and also connected with the Philadelphia Chamber of Commerce, will be the other speaker.

## Export Managers Form Seventh Boosters Club

NEW YORK, Dec. 19—The seventh of the Automotive Boosters Clubs was tentatively organized here today, as the result of a meeting of about fifteen export managers and representatives who determined upon the formation of an export section of the club. Headquarters will be maintained at New York, with periodical meetings for the discussion of export problems.

The new club was got under way at the insistence of H. L. Kraus, export manager of the Apco, Biflex and Simmons companies, who called today's organization meeting. It was addressed by Kraus and Ben Asch, as representative of the parent New England Booster's Club, and a decision was reached to hold a second meeting during the week of the New York show when further details as to officers, plans and membership will be discussed.

An organization committee was named composed of H. L. Kraus; J. F. Kelly, Jr., export manager Electric Storage Battery Co.; Walter Rinck, export manager Stevens & Co.; R. A. Rodriguez, of Rodriguez & Co., and George E. Quisenberry, managing editor of *El Automovil Americano*.

The club will be limited in membership to representatives of equipment houses selling through the jobbing trade. As the overseas trade in these equipment lines has been increasing rapidly and as it is believed that a further impressive development may be expected, the export managers believed that an organization is needed through which such common problems as credits, merchandising methods, packing, etc., can be discussed.

## Hupp Adds Millions to Working Capital

**New Stock to Be Issued Will Be Used for Future Growth—  
Details of Plan**

DETROIT, Dec. 18—With its building program now practically completed, the Hupp Motor Car Corp. will increase its outstanding capital stock by approximately \$4,000,000, to provide ample working capital for future growth.

By the retirement of all outstanding preferred stock, the company will place itself on the basis of having common stock as its only outstanding issue. Plant extensions and improvements during the past four years have cost \$7,000,000 paid wholly out of earnings.

## Financial Condition Strong

The company's financial position never was better, nor has it ever been in better position to pursue an active manufacturing program, declares Vice-President Von Schlegel. Of the original 1,500,000 of preferred issued, all but 4052 shares have been retired from earnings, and these will be redeemable at 120 from the proceeds of common stock issue. Less than a half a million of the proceeds will be used in this way.

Holders of common stock of record will be entitled to subscribe to the issue of 342,678 shares at \$12.50 a share. Common stock outstanding will be increased 60 per cent. Apportionment to present holders will be at rate of three-fifths of share for each share held. Subscription warrants will be mailed to stockholders of record Dec. 24, specifying the amount they shall be entitled to subscribe. Ladenburg, Thalman & Co. are agents for the company.

In connection with the new stock, the company declares in a letter to stockholders that a quarterly cash dividend of 2½ per cent has been declared, payable Feb. 1 to stock of record Jan. 18, which will include the new issue. Business of the company during the current year will total more than forty million. There is no bonded indebtedness.

## Previous Expansions

Of the expansions made in the past four years, the addition to the main manufacturing plant in Detroit is the most important. This has given practically doubled space for final manufacturing operations. The body plant of the company at Racine has been brought to high production, and with the addition of a plant now nearing completion in Detroit will give the company complete coverage for all body requirements in quantity.

An idea of its planned body facilities is gained from the fact that it will be in position to make 1000 closed bodies monthly for one model alone. Production can be on a 75 per cent closed body basis next year, if demand runs that high.



## New York Dealers Form Federation

Twelve City Associations Make  
Up Membership—First  
Convention Held

SYRACUSE, Dec. 20—Twelve city associations of automobile dealers have formed the Empire State Automobile Merchants Association. They include New York, Brooklyn, Albany, Syracuse, Rochester, Schenectady, Binghamton, Poughkeepsie, Elmira, Utica, Oswego and Rome. Each city association is a member and dues are paid on the basis of \$10 per year per dealer member of the local association, under which plan, for instance, the New York association pays \$550 a year and some up-state organizations from \$100 up. The association will try to improve trade conditions and foster equitable legislation.

### A. E. Moree Manager

The association has been in existence on paper since last spring. It was permanently organized last week at a convention attended by 150 dealers, including delegates from the twelve association members. The general manager is E. A. Moree, who has been loaned for part-time work by the Automobile Merchants Association of New York City, of which he is also general manager. Headquarters will be temporarily in the general manager's New York City office in the Fisk Building.

The association organized on a federation instead of individual member basis to avoid the experience of some State organizations whose managers have had to spend much of their time dunning individual members for dues.

Since last spring the association has taken hand in a number of conferences with State administrative and legislative affairs and will have active representation in the coming sessions of the legislature. Its policy will be to cooperate with state officials in formulating constructive, legislative and administrative policies rather than to wait until policies are formulated and then avoid them.

### Plans of New Body

Possible activities for the association under consideration include indorsement of a used car plan—possibly the N. A. D. A. or Appleby plan, establishment of a central testing laboratory to pass on accessories and supplies, establishment of a central purchasing agency and cooperative arrangements with insurance companies.

Addresses at the convention were made by Alfred Reeves of the National Automobile Chamber of Commerce, Harry Meixall of the Motor Vehicle Conference Committee, and C. H. Paton of the Used Car Bureau of the Cleveland Automobile Manufacturers and Dealers' Association.

The association elected the following officers: President, E. J. Ellis, Dodge Brothers, Rochester; vice-presidents, H.

A. Rayno, Albany, and Reginald G. Smith, Dodge Brothers, Rome; treasurer, Joseph Haas, Ford and Lincoln, Brooklyn; secretary, L. D. Clute, Ford, Elmira. The officers and the following are directors: W. W. Garabrاندt, Franklin, Utica; C. W. Bull, Marmon and Hudson-Essex, Syracuse, the latter having been president of the association since its formation.

## New Division for Reo Going in Duplex Plant

DETROIT, Dec. 19—The Reo Motor Car Co. will create a new division when it takes over the plant of the Duplex Truck Co. in March to specialize in transportation equipment for individual requirements. Special equipment required by buses, taxicabs, delivery trucks and other vehicles will be made in the new unit, and the vehicle furnished complete to the purchaser, where formerly he was obliged to have the special equipment made himself.

The extent to which Reo plans to enter this new work is intimated when it is declared that, not only will all of the acquired buildings be necessary, but that additions probably will be made.

The Duplex Truck Co. will remove from its Lansing plant to its former plant at Charlotte, decision having been made to do this as soon as the State Highway Department has had opportunity to remove its equipment from the Charlotte plant. The former plant will be placed in condition for truck manufacture as soon as possible, according to Joseph Gerson, new general manager of Duplex, though this probably will not be before March 1.

## Equipment Business McCord's Specialty

DETROIT, Dec. 19—In an interview with Percy L. Barter, vice-president of the McCord Radiator & Manufacturing Co. by D. M. McDonald in Automotive Industries last week, the unintentional inference was given that McCord plans for business in the replacement field in the coming year were given preeminence over its sales plans to car and truck manufacturers. McCord is essentially an equipment manufacturer. That replacement business will run larger because of the large number of cars added this year to those in use is unquestioned, but the equipment field is the large end of the business.

### ATLANTA FOR APPLEBY PLAN

DETROIT, Dec. 18—Twenty-four dealers of Atlanta, Ga., have signed an agreement with Percy Chamberlain Associates for the establishment of an Appleby Motomart in that city and will discontinue their used car departments at once. The list of dealers includes those handling practically every well-known make of car. L. L. Halle, formerly manager of the Atlanta Statistical Bureau, will be in charge.

## Oakland Plant Deal Awaits O.K. of Ford

All Negotiations for California  
Site Have Been Completed by  
Detroit's Representatives

OAKLAND, CAL., Dec. 17—Negotiations for the purchase of seven acres fronting on the Oakland Estuary at the foot of Dennison Street, Oakland, from the Standard Gas Engine Co., for the erection of an assembling plant for Ford cars, have progressed so far that the reports, approved by engineers and by Mr. Ford's agents here, have been submitted to Mr. Ford for final O.K. The plans for the new assembling plant call for an establishment to produce 4000 cars daily.

### Scope of New Plant

Arrangements for tracking, deep-water access, power, utility service and water have been made. The new plant ultimately is to cover fifteen acres, and negotiations are under way for the addition of nearly eight acres adjoining the Standard company's holdings and belongings to three different owners, are now being carried on. Ford's agents here have taken a short option on a tract of twenty acres in the cheaper residential section, about twelve blocks from the factory site, for construction of homes for workmen in the plant. The consummation of this deal also rests on Mr. Ford's approval, the papers, maps and estimates now being in his hands. Agents of the Ford interests here refused to reveal the location of this tract other than its general distance from the Standard Gas Co.'s land.

Shortly after the visit of Ediel Ford to Oakland and San Francisco about a year ago, he announced that no location would be considered for a Pacific Coast plant which did not have deep-water accessibility. The city engineer of Oakland has been in conference with Mr. Ford's engineering representatives here for the past two months, and with engineers for this army district, on the dredging of the Oakland Estuary north of Government Island, where the Ford plant is to be located. Several years ago Mr. Ford obtained a large timber tract in northeastern Washington, and has more recently bought a sawmill of large size there. His engineers and agents have inspected seven sites for the factory on the Pacific Coast before selecting Oakland.

### Ford Buys Buffalo Site

BUFFALO, Dec. 18—The Ford Motor Co. has purchased twenty acres of land bordering on the barge canal for the erection of a new \$5,000,000 assembling plant, to take the place of the present plant, which has become inadequate. The capacity will be 500 cars a day as compared with 300 a day at present.

## Tire Needs in 1924 Put at 45,000,000

**Akron Estimates an Increase of  
Five Million Casings Over  
This Year's Output**

AKRON, OHIO, Dec. 17—In the face of the fact that Akron tire manufacturers are prone to discount the number of automobiles which the manufacturers say they will make during 1924, it is estimated that the rubber industry as a whole in America will make approximately 45,000,000 automobile and truck tires next year.

This estimate is based upon the 14,000,000 cars now in operation requiring approximately 26,000,000 tires, new cars requiring in the neighborhood of 12,000,000, while export trade will require about 2,000,000.

The estimate of 45,000,000 tires required during 1924 compares with estimated 1923 consumption of slightly in excess of 40,000,000 tires in the United States and exports from this country. This figure in turn compares with 36,400,000 consumed in 1922 and 26,000,000 in 1921 and a previous high mark of 32,400,000 in 1920.

Of the total number made in the United States, unofficial estimates indicate that at least 65 per cent were manufactured in the Akron district.

To meet this estimated demand, the Akron and other factories will be compelled to make considerable increases in production between now and spring, it is stated, because production at the present time is estimated to be on an annual production basis of not to exceed 15,000,000 tires.

The production hopes of January, in the face of decreasing inventory, do not bring up tickets to what appears to be the 1924 requirement.

## Midwest Discusses Need of a Tire Czar

CHICAGO, Dec. 17—At the monthly meeting of the Midwest Rubber Manufacturers' Association the topic most discussed was the need of a recognized leader of the industry to regulate activities and adjust controversies which under present conditions are the cause of unprofitable business for many tire manufacturers.

The specific suggestion was made that a New York banker who has shown considerable interest in the tire industry should be made arbiter with the same power in the rubber industry that Will Hays has in moving pictures or Judge Landis in baseball.

It was stated that nearly all manufacturers are losing money or failing to make a profit of their Ford size tires, which constitute at present about 70 per cent of the production.

The association voted to hold its annual

## AKRON LOOKING FOR HIGHER TIRE PRICES

AKRON, OHIO, Dec. 17—Two tire price increases seem to have been generally adopted for the coming year, the first to be made shortly after New Year's and the other some time in May.

It is estimated that the two increases will be in the neighborhood of 20 to 25 per cent and that one in January will be the smaller one of the two.

Increasing fabric costs is the primary justification to the public for the upward movement in prices. The public, it is believed, will feel that the industry is justified in raising the lists.

banquet Jan. 29 in Chicago and a committee was appointed to arrange for it.

## Tool Makers Organize, With Kennedy Leader

DETROIT, Dec. 17—Don F. Kennedy, president and general manager of the Sterling Manufacturing Co., has been elected president of the Detroit Tool Manufacturers' Association, just formed. Other officers chosen include: Vice-president, E. P. Kramer of the F. Joseph Lamb Co.; secretary, N. A. Woodworth, Ex-Cell-O Tool & Manufacturing Co.; treasurer, O. H. Siewek, Siewek & Snyder Tool Co.; director, W. D. McKenzie, Trio Tool Co.

The association starts with a membership of about thirty of the larger tool manufacturers of Detroit, most of whom are engaged in the manufacture of tools, dies, jigs and fixtures for the automotive industry.

## WILLYS COMMITTEE MEETS

DETROIT, Dec. 17—The Foreign Trade Committee of the National Automobile Chamber of Commerce held its first meeting with its new chairman, John N. Willys, at the Detroit Athletic Club last week to discuss details of the program for the World Motor Transport Congress. This is scheduled to be held in Detroit May 21 to 24, 1924. Willys succeeds as chairman J. Walter Drake, recently appointed assistant secretary of commerce on recommendation of Herbert Hoover.

## NEW BATTERY COMPANY

WAUSAU, WIS., Dec. 17—Manufacture of storage batteries, dry cells, electrical equipment and appliances, and wholesale dealing in kindred merchandise, are the purposes of the Marathon Battery Co., incorporated at Wausau, Wis., with \$150,000 capital by W. H. Thom and Edgar J. McEachron of Wausau and E. A. Fuller of Madison, Wis. A factory is now being equipped and preparations completed for starting active output, of batteries on Jan. 1.

## Firestone Earnings Smaller Than in '22

**Annual Statement Shows \$6,104,992 for Fiscal Year—General  
Declares Extra Dividend**

AKRON, OHIO, Dec. 17—The Firestone Tire & Rubber Co. at its annual meeting declared the \$1 a share common stock dividend as generally expected in rubber circles, but its earning statement was not as large as anticipated in tire circles.

Sales for the year amounted to \$77,583,149, which is an increase of 20 per cent over the previous year, but net earnings amounted to only \$6,104,992, which is only \$13 a share on common, as compared with \$16.60 a share common shown last year.

## Assets \$24,965,071

Current assets, as shown in the newest statement, amount to \$24,965,071, and current liabilities to \$8,290,234. Surplus account is reported in the statement at \$26,022,919.

Bank loans were reduced from \$12,775,000 to \$5,770,000, which is the principal reduction in current liability item of the report.

Sales for the past year compared with sales of \$64,507,000 reported for 1922; \$66,000,000 reported for 1921; \$114,000,000 reported for 1920, and \$91,000,000 business done during 1919.

Earned surplus compares with \$7,348,000 earned in 1922 and a deficit of \$19,010,000 shown in statement for the year ending 1921 and a deficit of \$1,549,000 shown the previous year.

Current assets compared with \$25,458,000 reported for the year previous; \$30,604,000 reported for 1921, and \$63,396,000 reported for the peak year in the industry.

Current liabilities compare with the following: 1922, \$15,634,000; 1921, \$24,443,000, and 1920, \$32,648,000.

Surplus account compares with \$21,726,000 reported at the end of 1922; \$15,803,000 reported for 1921, and \$33,880,000 reported for 1920. In 1919 surplus account was reported at \$35,400,000 before Federal taxes.

Inventory was carried at \$9,852,000 at the end of 1922; \$12,534,000 in 1921, and \$45,163,000 in 1920.

## General Declares Dividend

Declaration of an extra 6 per cent dividend on common stock and semi-official announcement that 1923 earnings were greater than those of 1922 by the General Tire & Rubber Co. confirms forecasts made regarding the showing of this company.

Sales are said to be in excess of \$7,200,000 reported the previous year and profits larger than the \$1,020,000 reported for 1922. Unit production has been much larger than last year because capacity of plant was increased early this year.



## New Air Cooled Car to Be Made By Field

### Wisconsin State Railroad Commission Authorizes Rice Lake Company to Sell Stock

MILWAUKEE, Dec. 17—Development of a new passenger car industry in Wisconsin has progressed another step since the State Railroad Commission granted the Field Motor Co. of Rice Lake, Wis., capital stock \$50,000, authority to sell shares. The commission made an exhaustive investigation of the project, and after six months' consideration has issued the permit.

Thomas H. Field, one of the earliest Ford dealers in America, who for five years has been perfecting a new design of light car embodying several radical departures from accepted practice, is the head of the new corporation. Pending the grant of a permit to finance the venture, he has been working on his own funds and voluntary advances from Rice Lake citizens who now become stockholders. The first practical model of the new Field car is now being completed.

The Field car will be powered with a "twin-two" air-cooled engine and will carry a novel spring suspension system, with new ideas worked out in transmission and braking systems. Most of the production until now has been done under contract with the O. E. Szekely Co., Moline, Ill.

It is planned to start assembling of cars in Rice Lake about March 1 or April 1. For the time being parts and units will be contracted for. Practically all of the capital of the new corporation has been subscribed for and will suffice to finance the operations planned for the present.

Officers of the new company are: President, T. H. Field; vice-president, J. H. Wallis; secretary, R. C. Peck; treasurer, T. W. Quinn; directors, the officers and George K. Mills.

### Rickenbacker Motor Co. Stops Sale of Stock

DETROIT, Dec. 17—Sale of Rickenbacker Motor Co. stock has been discontinued following the subscription of the \$4,000,000 capital stock placed on the market. The company holds \$1,000,000 of its authorized issue of \$5,000,000 in the treasury. According to a statement by President B. F. Everitt, the company has slightly more than 10,000 stockholders, with large blocks of stock held only by active executives of the company.

Though originally determined to sell the entire authorized stock, directors, after operation of the plant for a short period, decided that one million of this could be held in the treasury and that there would be ample capital for profitable operation.

In his statement on the company's

### TRAFFIC SCHOOL FOR SENTENCED DRIVERS

MINNEAPOLIS, Dec. 17—Traffic violators on probation with workhouse sentences against them will be ordered to traffic school for a course of one lesson a week for five weeks. Absences will be reported to Judge Levi M. Hall, the traffic judge. The first class, now under way at Dunwoody Institute, numbers twelve. M. R. Bass is in charge for Dunwoody and members of the safety bureau of the Civic and Commerce Association will give lessons in driving through the congested districts downtown.

The instruction is in principles of the traffic code, guiding and handling motor cars, and there is some home study work. A closing oral and written examination will be given on rules of the road, city and State traffic laws, with practical demonstration in driving. Upon the report of instructors the judge will decide whether to lift the workhouse sentence.

financial position, Everitt says every director of the company is an active officer, and to this fact he ascribes much of the reason for Rickenbacker success. Salaries paid executives practically place them in the dollar a year class, he said, and they are dependent for most of their return from dividends on stock.

### Kearns Truck Plant to Go to Lewistown

DANVILLE, PA., Dec. 17 — The Kearns-Dughie Motors Corp. of this city, maker of the Kearns truck, has purchased the assets of the Belmont Motors Corp. of Lewistown, Pa., which includes machinery, trucks, parts and plant. Manufacturing will be carried on at Lewistown, while the Danville plant will be used as a branch for sales and service in this part of the State. This gives the Kearns company a modern plant with 70,000 sq. ft. of floor space and will permit it to increase its production of one to five-ton trucks, special fire apparatus and chemical trucks. The company also will build all kinds of commercial bodies and hoists.

### STEEL PRODUCTS OPERATING

SHEBOYGAN, WIS., Dec. 17—The Steel Products Co., organized with \$100,000 capital to take over and continue the operation of the automobile bumper and equipment business developed by the Jenkins Machine Co. of the same city, has perfected its organization by electing these officers: A. G. Stuedeman, president; Robert C. Ebenreiter, vice-president; Fred Zschetzsche, secretary, treasurer and general manager. The transfer has been effected, and the new company is now manufacturing the line, using a part of the Jenkins plant.

## Lighter Model Added to Diamond T's Line

### Special Delivery Type Will Have 130-Inch Wheelbase and Four- Cylinder Hercules Engine

CHICAGO, Dec. 17—A new model, known as Special Delivery model 75, has been added to the Diamond T truck line. The truck is designed for high speed light delivery work and serves as a complement to the line of heavier models that this company has been making in the past and will continue.

The new truck is mounted on a 130 in. wheelbase and has a frame length back of the rear seat of 90 in. It is designed for loads of from 500 to 2000 lb. The engine is a 4 x 5 in. four-cylinder Hercules fitted with a Zenith carbureter. Unit powerplant, three point suspension construction, is employed, the clutch and transmission gearsets being Covert, and the axles Columbia, full floating.

The frame is a product of the A. O. Smith Corp. and is so designed that the power plant is mounted low to reduce the center of gravity of the truck. The frame side rails are 5 in. in depth with 3 in. flanges and 3/16 in. material. The dash acts as a cross member as on the larger Diamond T trucks, being of plate steel securely anchored to the frame. This also provides a firm anchorage for the cab.

Hotchkiss drive through 50 in. semi-elliptic springs is employed. The rear springs have nine leaves, and the front springs are 40 in. long with seven leaves. The tires are 33 x 5 in. truck cords.

### Red Gasoline Favored by Bureau of Mines

WASHINGTON, Dec. 17—The Bureau of Mines has made the suggestion that motor gasoline be colored red as a safety measure to guard against accidents through carelessness.

Pointing out that the use of red is considered almost universally as an indication of danger, W. A. Jacobs, chemical engineer of the bureau, declares that red gasoline would be a sure preventive against motor fuel being mistaken for water.

A precedent already has been set, according to the bureau, for in war time the army and navy require that all gasoline of the so-called "fighting grade" be colored red to distinguish it from the ordinary motor gasoline.

Seven cents will buy enough dye of a red color to color 1000 gal. of gasoline and the bureau tests show that the dye has no deleterious effect on the gasoline of the motor engine in which it is burned. Tests made show that one ounce of dye will color 1000 gal. of gasoline instantly and make it a brilliant red, which the bureau believes will result in a large annual saving to garage men in the reduction of accidents.

## Men of the Industry and What They Are Doing

### Boulden Will Quit Selden

Hal T. Boulden, who for nearly nine years has been connected with the Selden Truck Corp. of Rochester, N. Y., first as sales manager but for the past five years as vice-president in charge of sales, service and advertising, will, it is reported, sever his connections with that company. Mr. Boulden was one of the founders of the National Association of Motor Truck Sales Managers, which later merged with the Motor Truck Manufacturers' Association, the outgrowth of which was the present Motor Truck Industries. He also is given great credit for the equitable dealer's perpetual agency contract, which has been well standardized among manufacturers. As yet no announcement has been made as to his future plans.

### New Dunlop Branch Manager

R. L. Marshall, fourteen years in the tire selling business, has been appointed manager of the Dunlop Tire & Rubber Co. branch at Dallas, Tex. He will be in charge of sales in Texas, Oklahoma, Arkansas and part of Louisiana. Of late Marshall has been in charge of truck tire distribution for the United States Rubber Co. in the Southwest.

### McCarty Back from Trip

Indications pointing to even greater advance of the automobile industry in 1924, so far as standard makes of cars are concerned, are seen by E. H. McCarty, general sales manager of the Nash Motors Co., who has returned to the factory after a business trip that took him through the Northwest, into Canada, down the West Coast, through California, through the Southwest to New Orleans and as far Southeast as Charlotte, N. C.

### Glass Old Timers' Chief

The Oakes Co. of Indianapolis has launched the Oak Co. Old Timers' Club, the membership requirements being five years' service. Having the longest record of service, eleven years, F. E. Glass, sales manager, is the first president. Thirty-two members attended the inaugural banquet, the combined years of service of the guests totaling 224 years.

### Dinner Given W. R. Wilson

A farewell dinner was tendered William Robert Wilson, who recently resigned as president of the Maxwell-Chalmers interests, by more than 100 of his former associates. Mr. Wilson's efforts in building the Maxwell-Chalmers organization into its present strength were accredited by such speakers as Arthur E. Barker, B. E. Hutchinson and W. Ledyard Mitchell, vice-presidents of the organization, and by Dr. F. T. Murphy and Allan Edwards, directors.

C. W. Hadden, assistant to Mr. Wilson, presided. A silver tea service was presented to the guest, inscribed: "Presented to William Robert Wilson in appreciation of his inspiring leadership and as a token of the affection and regard in which he is held by those who worked with him at the Maxwell Motor Corp."

### Coast Home for Willys

John N. Willys, president of the Willys-Overland Co., Toledo, has leased for the winter the residence of T. W. Warner of Durant Motors, the Warner family spending the winter months in California. Since his return to Toledo two years ago Mr. Willys has resided at the Toledo Club.

### Wood Will Build Furniture

Marshall C. Wood has resigned as field manager of the Brewer-Titchener Corp. of Cortland, N. Y., having bought a furniture manufacturing concern in the vicinity of Cortland which will specialize on kitchen furniture.

### Sanger Opens Own Office

Ernest Sanger has resigned as sales manager of the Michigan Lubricator Co. to open his own sales office from which he will handle several accounts for manufacturers selling to the automotive field.

### Boyes Goes to Coast

Bedford W. Boyes, manager of the Louisville branch of the General Motors Truck Co., has been transferred to Oakland, Cal., and will be succeeded in Louisville by Phillip A. Kelleher, who has been with the General Motors Truck Co. at Pontiac, Mich., ever since he was discharged from the Army in 1919. For the last year Mr. Kelleher has been sales promotion manager at the factory. Mr. Boyes has been with the General Motors Truck Co. in Kentucky since 1919. He organized the Louisville factory branch for this company in July, last year, and has been its manager ever since.

### REPORTS BUS PROFITS

WASHINGTON, Dec. 18—The Washington Rapid Transit Co., operating thirty-six buses, made a net corporate income of \$839.87 during November, according to a statement just filed with the Public Utilities Commission. During November of last year the company showed a deficit. Operating revenues of the company during the past month amounted to \$26,762, as against \$25,999 for the same months last year, while operating expenses totaled \$25,774 and \$27,207 respectively. The thirty-six buses during the month covered 136,500 miles, as against 148,682, the corresponding month of last year. Passengers carried were 328,817 as against 321,598 last year.

## Parts Distributors Plan Organization

### National Body Will Be Formally Launched During Show Period —Its Objects Outlined

DETROIT, Dec. 18—Formation of unit parts distributors into an organization to develop merchandising of standard parts nationally will be sought during the period of the national shows. The movement is understood to have the backing of several leading manufacturers in the specialized unit field, and several informal meetings already have been held, at which the possibilities of such an organization have been discussed.

Distributors of parts for one manufacturer already have pledged varying sums of money to pay for preliminary organization work, and this money has been augmented by subscriptions from several manufacturers.

In the opinion of the manufacturers and of the distributors, the sale of standard parts for these units could be greatly developed by the independent distributors working along definite policies. As planned, the organization would include distributors affiliated with all manufacturers and would not be limited to the distributors of any one group of unit makers. Plans would be made to sell standard parts along definitely fixed lines, and would have the effect of counteracting the sale of parts by others than the original makers of the unit.

Fundamentally the plan is made certain that service will be available for all units in every section of the country, not only as an auxiliary to dealer service, but through the hands of a group actively engaged in selling service and nothing else.

### M'CALL K. & F. RECEIVER

KENOSHA, WIS., Dec. 17—A. B. McCall of Kenosha has been appointed trustee of the bankrupt estate of the K. & F. Mfg. Co., Kenosha, Wis., and Horace G. Maddock, appointed receiver when the involuntary petition was filed some time ago, has retired from affairs. The K. & F. company manufactured tools, dies, jigs and fixtures, as well as steering wheel locks for automobiles and other specialties. Liabilities of the K. & F. company are \$110,000; assets, \$30,000.

### 6500 OLDS IN JANUARY

LANSING, MICH., Dec. 18—The Olds Motor Works is producing about 5000 cars a month and is planning for over 6500 cars in January, and in February 8000, with a steadily increasing production from month to month during the spring and summer.



## Nation Celebrates First Plane Flight

### Many Meetings Held in Commemoration of Wrights' Great Feat of Twenty Years Ago

DAYTON, OHIO, Dec. 17—The nation today celebrated the twentieth anniversary of the first successful flight of a mechanically driven airplane, which was made at Kittyhawk, N. C., by Orville and Wilbur Wright. Dayton, being the home of the Wrights, was the center of the celebration, but other cities also held meetings in honor of the occasion under the direction of the National Aeronautic Association.

In Dayton the celebration took the form of a mass meeting at which General Patrick, chief of the Army Air Service, and Admiral Moffet, in charge of naval aviation, spoke, each lauding the Wrights' contribution to the development of aviation.

Orville Wright, the surviving brother, was presented with a plaque by the citizens of Dayton, but the only part he took in the celebration was to make a radio address this evening. He also entertained a party of his friends at his home, while a large squadron of planes, comprising all of the many types used in the army at the local flying fields, circled over his home.

Comparison between the past and present was had through the exhibition at the public meeting of one of the first Wright planes ranged alongside of an army fighting plane, and a model of the ship in which the Kittyhawk flight was made.

A telegram was received by Mr. Wright from Secretary of the Navy Denby, which said that "the progress of aviation in the last twenty years is a lasting tribute to the work done by you and your lamented brother in the face of opposition and prejudice."

### Washington Remembers

WASHINGTON, Dec. 17 — Twenty years ago today man's first flight in a heavier-than-air machine was made at Kittyhawk, N. C., by Wilbur and Orville Wright, and fifteen years ago, or five years after the first successful flight, recognition was made by Congress, when the Wright brothers flew a heavier-than-air machine over Washington and secured a prize of \$25,000 from Congress for the feat.

To commemorate the progress made in aviation, Army and Navy fliers at Bolling Field, Md., which is located across the river from Fort Meyer, Va., where the tests were made on Sept. 10, 1908, are paying tribute to the pioneer of aviation by urging upon Congress the War Department's request that it be given \$65,000 every day for the next ten years to build up its air force.

Plans to make the first around-the-world air flight, beginning today, in celebration of aviation's twentieth birthday, had to be postponed because of inability of the

War Department to make final tests upon the machines, already built, but not as yet outfitted. Gen. Mason M. Patrick, chief of the United States Air Service, states.

### Mansfield Steel Corp. Plant to Be Auctioned

DETROIT, Dec. 17—Real estate, machinery and equipment of the Mansfield Steel Corp. will be sold at bankrupt sale, Jan. 10, at 11 a.m., by Gordon & Winternitz Co., Inc., auctioneers. The location is at East Milwaukee Avenue and Grand Trunk Railroads, and comprises 2.8 acres of ground.

The sale of the steel company will not affect the status of the Detroit Trailer Co., though this concern has been closely identified with the steel company through the fact that J. B. Mansfield is president of both corporations. The trailer company also has used the steel company property for its assembling operations, but is declared not at all involved in the steel company difficulties.

Decision as to future plans of the trailer company will be reserved until after the sale of the steel company. The trailer company will be continued, and its removal to another site is contingent upon the disposition of the steel plant. Mansfield declares no overtures have been made relative to a merger of the trailer company with another in the same field, though patent suits in which it is named are pending and may result in a possible merger.

### NEW PIERCE-ARROW POLICY

BUFFALO, Dec. 17—The Pierce-Arrow Motor Car Co., entering the bus field now, is separating the passenger car and commercial vehicle sales in some centers in order to concentrate on the truck business to a greater extent. In Boston the company has leased a large building on Commonwealth Avenue and contracted for the erection of another structure in the rear to be used for its commercial business, while the J. W. Maguire Co. will continue to handle the passenger car line and selling trucks and buses also to former customers. Positive denial that the company will abandon the manufacture of trucks is made by President Forbes.

### MORE BUS FACTS

WASHINGTON, Dec. 17—Statistics for the calendar year of 1922, filed by the Ohio Public Utilities Commission with the United States Census Bureau, show that there are seventy-one electric railway companies in the State of Ohio, operating fifty-two motor buses in conjunction with their electric service. A total of 2,637,352 passengers were transported in the buses during the year, while 966,725,000 were carried by the electric trolleys. Comparative figures of 1922-1917 show that there was a decrease in 1922 of 6.5 per cent in the number of passengers carried, attributed to the fact that more people are using automobiles.

## California to Test Motor Fuel Tax Law

### State Comptroller Riley Holds Charge Is License Imposed on Gasoline Vendors Only

SACRAMENTO, CAL., Dec. 17—The newly enacted and enforced gasoline tax law, placing a tax of 2 cents per gallon on all gasoline used in automotive vehicles, is to be tested in the Supreme Court of California, in so far as it applies to public service corporations.

The Los Angeles Gas & Electric Co. has sent a letter to Ray L. Riley, State comptroller, making formal demand for a refund of \$439.36 paid by this company to the Standard Oil Co. as a tax on gasoline. The Los Angeles Gas & Electric Co. takes the position that under the State constitution public service corporations which pay a gross receipts tax to the State government are exempt from all other State, city and county taxes.

Riley has refused to make the refund, and the Los Angeles company will start the test suit immediately. Riley holds that the gasoline tax is not a State tax, but is a license imposed on the gasoline vending companies, which, in turn, pass the license charge to the consumer.

In case the courts hold that public utility corporations are exempt under the constitution from paying this fee of 2 cents a gallon on gasoline, the State will lose approximately \$900,000 annually.

### More Routes Wanted On the Pacific Coast

WASHINGTON, Dec. 17—The construction of three national highways on the Pacific Coast, running from Canada to Mexico, is proposed in a bill introduced by Congressman John E. Raker of California. The roads are to be so constructed through the States of Washington, Oregon and California as to serve adequately peace time motor-truck needs and transport requirements during times of war.

Aviation's part in the future transportation systems of the country is recognized in the measure, which provides that along all three of these highways, every twenty-five miles, there shall be constructed a rectangle landing field, 640 ft. wide by 2640 ft. long, for the sole and exclusive use of commercial and pleasure aircrafts.

The first highway is to be known as the Balboa Highway and is to be located as close as possible to the Pacific Ocean, with laterals to strategic points seaward provided with emplacements for guns of long range at proper intervals from Port Angeles, Wash., to Tia Juana, Mexico. The second highway is to be known as the El Camino Sierra Highway, extending from Oroville, Wash., to Los Angeles, and the third, the Pacific Highway, from Blaine, Wash., to El Centro and Calexico, Mexico.

## Traffic and Safety Platform Discussed

### Chamber's New Committee Prepares for Active Campaign on Industry's Big Problem

DETROIT, Dec. 17—The Traffic and Safety Committee of the National Automobile Chamber of Commerce, only recently created, held its first meeting in this city last week, presided over by Chairman George Graham, and with all its members—Alvan Macauley, E. S. Jordan, A. B. C. Hardy and George H. Pride—in attendance.

Promising to be one of the most important of the N. A. C. C. committees, the Graham body took advantage of the opportunity to get its bearings before attempting to adopt a definite policy. The policy of the committee was outlined, and after threshing over various problems, it was decided to wait until the next meeting, which will be held in New York Jan. 9, before outlining the platform. The members of the committee wish time to study the data on hand before making any commitments, so that remedies suggested will not be simply theoretical.

One decision arrived at was to organize some central assembling point of statistics on causes of accidents, and newspapers and other important local institutions will be asked to cooperate in gathering casualty statistics for the committees. A questionnaire is being drafted for distribution which will thoroughly cover every accident, and if this blank is used by the authorities, the statistics gathered as to causes, etc., will be most valuable.

Along these lines a new idea was advanced which seemed to meet with favor. That was that in serious accident cases that the cars involved be impounded by the authorities immediately, so that their mechanical condition can be ascertained before the owners have a chance to prepare any alibis based on alleged broken steering knuckles, faulty brakes, etc. The committee will go into this subject more fully at its next meeting.

It also was decided to work with bodies actively engaged in city planning, and to give what information it can to the National Conference on City Planning.

### Sales Pressure Rushes Overland Inventory

TOLEDO, Dec. 17—The Willys-Overland Co., which has been running on an especially large schedule for this month, will shut down Tuesday for inventory. However, due to the pressure of sales, it has been announced that the plant will get under way again before Jan. 1, the usual two weeks' period for inventory having been cut short.

The company will run considerably more than 200,000 cars produced this year for a new high record.

### QUAKE ZONE A MECCA FOR MANY USED CARS

HONOLULU, T. H., Dec. 5 (by mail)—Used cars by the hundreds are being shipped from the United States to Japan for use in the devastated areas of Tokyo and Yokohama. The steamship Kendal Castle, which arrived here early in December from New York via Panama Canal, carried 300 automobiles, principally Fords, consigned to Japan.

Every boat passing through here from United States ports since the earthquake has had on board ten to 200 used automobiles for Tokyo and Yokohama. More than 200 used cars have been shipped by Honolulu dealers to Japan during the last few weeks.

It is explained that the unusually large demand for these cars is due to the fact that practically all of the automobiles in the earthquake zone were destroyed and that with the clearing of the streets of debris the necessity for a means of rapid transportation is made manifest.

Since the earthquake there is a big shortage of rickshaw men in the two cities and many of the used cars now being received are for jitney service.

Schedules for the new year call for 12,500 cars a day within a few weeks after the first of the year, and it is believed that 1924 will see considerably larger production than the year just closing.

All Toledo automotive plants have been enjoying excellent business at the year's end. There are at work in the twenty largest plants here more than 25,000 men, as compared with 15,000 at the same time a year ago.

Prospects for 1924 are good, in the opinion of the manufacturers, especially the first six months.

### TO MAKE BODY FITTINGS

MILWAUKEE, WIS., Dec. 17—Manufacture of automobile body fittings, materials and supplies will be undertaken by the Manegold Manufacturing Co. of Milwaukee, a new Wisconsin corporation capitalized at \$50,000. The principals are William H. and Frank W. Manegold and Arthur A. Mueller, attorney, 105 Wells Street, Milwaukee.

### TO SELL HERCULES ASSETS

MILWAUKEE, WIS., Dec. 17—E. L. Cullen, receiver of the Hercules Steel Casting Co., 871-881 Robinson Avenue, has been directed by the Milwaukee Circuit Court to offer the entire assets and property for sale. Bids are now being taken until Jan. 21, 1924, by the receiver at the offices of the plant.

## VerLinden Buys in Ryan-Bohn Foundry

### Purchases Big Plant at Lansing, Mich., at Receiver's Sale for \$300,000

DETROIT, Dec. 17—The Ryan-Bohn Foundry Co.'s real estate, plant and equipment in Lansing was bought in by Edward VerLinden, president, at receiver's sale for \$300,000, the price being subject to confirmation by Judge Charles B. Collingwood. VerLinden left Lansing following the sale without statement as to his plans for operation of the plant should the bid be confirmed.

The Ryan-Bohn foundry is one of the largest in the State and capable of large production. The plant and property originally cost \$1,200,000, and VerLinden was one of the organizers and original stockholders. For the past several years the company has been in financial difficulties through commitments for material made during the high price era. Because of these it was unable to fulfill its contracts with automotive companies at a profit.

J. W. Wilford, who has operated the plant as receiver, conducted the sale. No intimation had been given by VerLinden as to his plans, Wilford said. Until the sale is confirmed or rejected, the plant will be continued in operation by the receiver. Limited business and more limited profits in the foundry field because of present competitive conditions, said Wilford, make the future operation of the plant a matter of conjecture.

VerLinden was formerly president of Olds Motor Works and later president of the Durant Motor Co. of Michigan.

### Piston Ring Concern Moves to Wausau, Wis.

WAUSAU, WIS., Dec. 17—Formation of the Wausau Motor Parts Mfg. Co. of Wausau, Wis., as already noted, is in effect a reorganization of the Menominee Piston Ring Co., which has disposed of its interests to Wausau capital and has moved its factory from Menominee, Mich., to the Wisconsin city. The concern was first organized five years ago to manufacture a patented piston ring designed by S. E. Johnson, who is retained by the new owners as factory manager and has been elected treasurer of the new corporation. E. H. Viele has been elected assistant secretary-treasurer and general manager. Prominent Wausau capitalists occupy the other offices, as follows: President, Karl Mathie; vice-president, W. R. Scholfield; directors, W. E. Curtis, E. K. Schuetz, Joseph F. Smith and Frank Mathie.

In addition to increasing the output of piston rings from 2500 to 5000 per day, the new concern will manufacture pistons and other gas engine replacement parts for the jobbing trade.



## Farmers Using Cars Mostly for Business

### Government Survey Shows That Two Thirds of Rural Automob- iles Cost Less Than \$500

WASHINGTON, Dec. 19—From two-thirds to nine-tenths of the use of an automobile on a farm is for business purposes rather than for pleasure.

A survey just completed by the Farm Movement Bureau of the United States Department of Agriculture reveals the fact on the 1371 farms surveyed, 923 farmers owned 1008 automobiles or trucks. The survey on which the figures are based was made in "representative" counties throughout the United States.

In the Atlantic Coast area, Chester County, Pa., was chosen. Fifty-eight per cent of the 423 farmers interviewed had cars. In the counties in Kansas, South Dakota and Colorado, 70 to 85 per cent of the 383 farmers had automobiles or trucks. In Washington and Idaho, 86 per cent of the 250 farmers reported ownership of cars. The only region where less than 50 per cent of the farmers owned automobiles was in the dry farming wheat area where 315 farmers reported only 152 machines.

#### Open Car Most Popular

The survey shows that the most popular type is the open car. Two-thirds of all cars were of this type. Of the whole, 25 per cent were trucks. Roadsters, sedans and coupés were less than one-tenth of all machines used.

Some figures on the price and length of use of farm automobiles reveal the fact that two-thirds cost less than \$500 f.o.b. factory; the average purchase price of open cars was \$689; the estimated length of life, from seven to eight years; that of the other third that cost more than \$500, the prices ranged from \$850 to \$1,250. Only eleven high priced cars were included in the entire survey.

Cost figures show that the average for an open car on the farm, including depreciation, was between \$200 and \$300. Gas and oil made up about 50 per cent, with cost of tires, repairs and license fees making up the balance. Practically none of the cars was insured.

## Diefendorf to Make C. P. C. Steering Gears

DAYTON, OHIO, Dec. 17—C. P. C. balance pressure Ford replacement steering gears are now being made by H. G. Diefendorf, who has purchased the steering gear division of the Recording Devices Co. of this city. Manufacture of this device is being continued temporarily in the plant of the Recording Devices Co., pending negotiations for the manufacture on a large scale of this and the larger models.

This steering gear is being made under patents of J. P. Lavigne of Detroit.

The Model D-1, suitable for cars weighing 3000 lb., is used on many racing cars, while Model D-2 is designed for the heavier type of passenger cars and medium trucks. Model B, the first type developed, is used on heavier vehicles.

Immediate production of the Ford model and Model D-1 is planned, but Models D-2 and B for larger cars and trucks will not be pushed at present.

## New Rochelle Teacher Awarded N. A. C. C. Prize

WASHINGTON, Dec. 17—Miss Teresa M. Lenney, a teacher in the New Rochelle, N. Y., public schools, contributed the best practical lesson on highway safety entered in the 1922 national contest, according to announcement today by the Highway Education Board. More than 60,000 elementary school teachers competed.

Five hundred dollars in cash and a trip to Washington with all expenses paid is the reward Miss Lenney will receive, her prizes the gifts of the National Automobile Chamber of Commerce.

Altogether more than \$1,000 is given by the automotive organization to the teachers to stimulate interest and concern in the problems of highway safety, aside from a more substantial sum, approximately \$4,500, given children for essays on the subject.

## Lockheed Four-Wheel Brakes for 1924 Moon

ST. LOUIS, Dec. 17—Moon cars will be fitted with Lockheed four-wheel band brakes as optional equipment at extra cost, according to announcement made here today by the Moon Motor Car Co.

A tank holding about one quart of the fluid which fills and operates the system is mounted on the dash under the hood. This fluid consists of equal parts of glycerine, alcohol and castor oil, but ordinary lubricating oil can be used in an emergency.

Details of front axle construction are not yet announced, but a car with four-wheel brakes will be exhibited at the New York show.

It is claimed that the brakes interfere in no way with steering, and that the chances of skidding are greatly reduced.

## HAYNES CAN SELL BONDS

INDIANAPOLIS, Dec. 17—The Securities Commission of the State of Indiana has endorsed the proposal of the Haynes Automobile Co. of Kokomo to issue bonds totaling \$2,750,000, the bonds consisting of \$1,750,000 worth of first mortgage bonds and \$1,000,000 of income bonds. This clears the way for immediate action on the sale of bonds and securities. It is said that one member of the Haynes organization will take \$500,000 worth of the security, and it is understood that certain creditors who have the welfare of the company at heart also are to give similar concrete evidence of their support of the present plans.

## Crow Chosen Chief by Trailer Makers

### New Association Elects Officers and Discusses Legislation—

#### A. P. Ames Made Manager

DETROIT, Dec. 17—M. E. Crow of the Troy Trailer & Wagon Co. has been elected president of the Trailer Manufacturers Association of America, succeeding J. H. Fertig, president of the Arcadia Trailer Corp. Other officers elected included H. C. Fruehauf, Fruehauf Trailer Co., Detroit, as first vice-president; S. B. Winn, Lapeer Trailer Corp., Lapeer, Mich., as second vice-president; Henry M. Wood, Trailmobile Co., Cincinnati, as secretary-treasurer. Allan P. Ames has been formally appointed manager of the association, with headquarters at 115 Broadway, New York City, while S. E. Liedabrand, Automotive Trailer Corp., Springfield, Ill., has been chosen as a member of the executive committee to fill the vacancy caused by the resignation of President Fertig.

The meeting at which these officers were elected was held in Detroit and is the first since the organization of the association.

#### Takes Up Legislation

It was decided that the activities of the association should be confined for the present, at least, mainly to legislative work and cooperative publicity. With this idea in mind, Frank Schmidt of Toledo, president of the Ohio Commercial Haulers Association, asked the help of the association in the litigation now in progress in Ohio to obtain a favorable interpretation of Section 7246 of the State Highway Law. In this case the lower courts have held that a motor truck with semi-trailer attached should be regarded only as one vehicle, and that its maximum load should be limited accordingly. The trailer dealers and haulers contend that a semi-trailer thus attached is a separate vehicle.

Although the meeting decided that the association as an organization could not appropriate funds for a purely intra-state contest, several of the members present agreed to contribute to the cost of this litigation in their private capacity.

The constitution of the association was amended by creating a new class of membership to be known as associate members, to which shall be eligible firms manufacturing only trailer parts in a comparatively minor branch, without power to vote or hold office.

## MISSOURI BUS BUSINESS

WASHINGTON, Dec. 17—Transportation figures filed by the Missouri Public Utilities Commission for the year of 1922 show that a total of 1,088,295 passengers were carried by thirteen motor buses operated by the nineteen electric railway companies operating in the State that year.

## FINANCIAL NOTES

Chandler Motor Car Co. reports gross profits of \$2,731,324 for the six months ended June 30. After payment of all charges and allowing reserves for depreciation, a net profit, before Federal taxes, of \$1,924,326 was shown, equal to \$6.87 a share earned on the 280,000 shares of no par value capital stock outstanding.

Gardner Motor Co. reports net earnings of \$128,484 for the nine months ended Sept. 30. This is interpreted to mean that earnings of about \$1 a share will result for the whole year. It is expected that 1924 production will run between 9000 and 9500 next year.

Edmunds & Jones Corp. has declared an extra dividend of 50 cents in addition to the regular quarterly dividend of 50 cents on the common and regular quarterly dividends of 1 3/4 per cent on the preferred, all payable Jan. 1 to stock of record Dec. 20. These are the same amounts that were declared for the two previous quarters.

All Nations Invited  
to Discuss Motor Laws

NEW YORK, Dec. 18—An added feature of the world motor transport conference which is being promoted by the National Automobile Chamber of Commerce and which will be held in Detroit next May, will be an international conference on motor vehicle legislation. This will be handled by the Chamber's Legislation Committee, of which H. H. Rice is chairman. Delegates from the nations represented in the transport convention will be asked to also attend the legislation meeting.

"Automobile Dollar"  
Now Worth 111 Cents  
(Continued from page 1272)

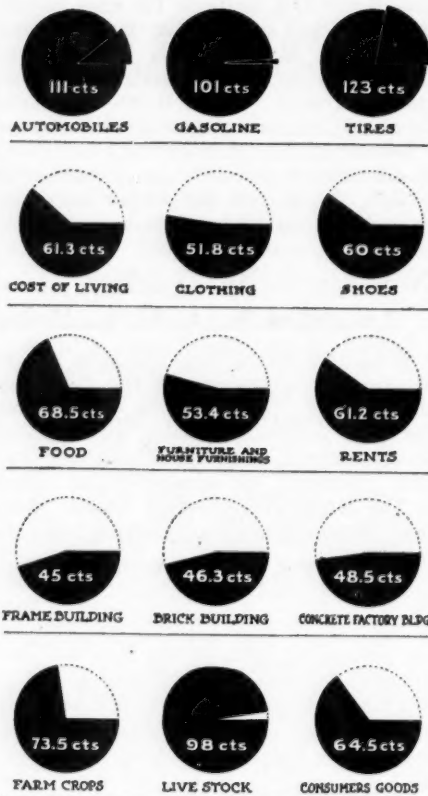
reducing prices, in the confidence that the public would respond to exceptional value. The output of 4,000,000 vehicles this year, 50 per cent ahead of any preceding year, has justified that confidence.

The following table shows the purchasing power of the 1913 dollar in various commodities and gives the source of the data.

| 1913       | Commodity                       | 1923       |
|------------|---------------------------------|------------|
| 100 cents  | Automobiles .....               | 111 cents  |
| 100 cents  | Gasoline .....                  | 101 cents  |
| 100 cents  | Tires .....                     | 123 cents  |
| *100 cents | Cost of Living.....             | 61.3 cents |
| 100 cents  | Clothing .....                  | 51.6 cents |
| 100 cents  | Shoes .....                     | 60 cents   |
| 100 cents  | Food .....                      | 68.5 cents |
| 100 cents  | Furniture .....                 | 53.4 cents |
| 100 cents  | Rents .....                     | 61.2 cents |
| 100 cents  | Frame Building.....             | 45 cents   |
| 100 cents  | Brick Building.....             | 46.3 cents |
| 100 cents  | Concrete Factory Building ..... | 48.5 cents |
| 100 cents  | Farm Crops .....                | 73.5 cents |
| 100 cents  | Live Stock .....                | 98 cents   |
| 100 cents  | Consumers Goods.....            | 64.5 cents |

\* 1914 used as base, as 1913 figures were not obtainable.

Sources of data were: Automobiles, Cleveland Trust Co.; gasoline, Oil Trade Journal; tires, "Tires" (a trade publication); cost of living, National Industrial Conference Board; clothing, U. S. Bureau of Labor Statistics;



The above chart, prepared by the National Automobile Chamber of Commerce, shows that more value is received for the money today in buying automobiles, gasoline and tires than in 1913. Using the 1913 dollar as standard, it now buys 111 cents' worth of automobile, 101 cents in gasoline and 123 cents in tires. In most other commodities the 1913 dollar buys only 60 cents worth of goods

shoes, Survey of Current Business; food, U. S. Bureau of Labor Statistics; furniture and house furnishings, U. S. Bureau of Labor Statistics; rents, U. S. Bureau of Labor Statistics; frame building, Survey of Current Business; brick buildings, Survey of Current Business; concrete factory building, Averthaw Construction Co.; farm crops, U. S. Department of Agriculture; consumers goods, Federal Reserve Board; live stock, U. S. Department of Agriculture.

Maryland Club Wants  
Compulsory Insurance

WASHINGTON, Dec. 18—The passage of a State law compelling every automobile driver in Maryland and approximately 50,000 from the District of Columbia to 'carry insurance protecting those whom they might injure or whose property they might damage, has been asked by the Automobile Club of Maryland in a resolution sent to the State Legislature.

This law, members say, is aimed at "financially irresponsible" drivers who injure innocent persons and are unable to give satisfactory compensation for the damage done. The club has announced its intention of pressing the legislation at the next session of the Legislature.

## BANK CREDITS

Written exclusively for AUTOMOTIVE INDUSTRIES by the Guaranty Trust Co., second largest bank in America.

Last week's developments were irregular. Prices in general showed a slight downward tendency while reports as to trade volumes, particularly along holiday lines, indicated improvement.

The final report of the Department of Agriculture estimates the farm value of American crops on Dec. 1 at \$8,322,695,000, comparing with \$7,449,804,000 a year ago and \$5,629,548,000 in 1921. Corn is valued at \$2,222,013,000, against \$1,910,775,000 last year; wheat at \$725,501,000 against \$873,412,000, and cotton at \$1,563,347,000 against \$1,161,846,000.

Employment in 1428 concerns surveyed by the Federal Employment Service declined about one-half of 1 per cent in November. The largest declines were in iron and steel, leather and food, while increases were noted in tobacco, paper and printing and non-ferrous metals.

The preliminary figures of foreign trade for November show exports of \$404,000,000 and imports of \$292,000,000, comparing with exports of \$400,823,538 and imports of \$308,366,493 in October. In November last year exports were valued at \$380,056,542 and imports at \$291,931,746. November's export balance of \$112,000,000 is the largest of the year to date, with the exception of September, and the largest November balance since 1920.

Building permits reported to Bradstreet's for 160 cities in November amounted to \$245,937,243, as against \$265,667,057 in October and \$200,080,543 in November a year ago. For the first eleven months of this year, permits issued represented a value of \$2,837,000,000, an increase of 24.4 per cent over the previous high record of last year.

The Fisher index of wholesale commodity prices stood at 150 last week, marking a new low record for the year. The index for the preceding three weeks was 151. Bradstreet's food index was \$3.33, as compared with \$3.38 the preceding week and \$3.52 a year ago.

Discounts by Federal Reserve banks increased \$15,700,000 during the week ended Dec. 12, the chief gains being in discounts of commercial paper. Purchased bills increased \$31,000,000, total deposits \$36,200,000 and Federal Reserve notes \$14,200,000. Members' reserve deposits gained \$39,500,000, while reserves decreased \$4,000,000. The reserve ratio declined from 76.4 to 75.3 per cent.

Loans of reporting member banks increased \$23,000,000 during the week ended Dec. 5, a gain of \$29,000,000 in loans secured by stocks and bonds being partially offset by small declines in other loans. Investments declined \$6,000,000 and reserve balances with Federal Reserve banks \$2,000,000, while net demand deposits increased \$5,000,000 and cash in vault \$9,000,000. Accommodation at Reserve banks decreased \$35,000,000.



## No Cut Expected in Sheet Steel Prices

Renewed Buying on Large Scale  
by Automotive Interests, Reported in Pittsburgh

PITTSBURGH, PA., Dec. 17—It now can be definitely stated that the change in the sheet steel situation precludes the possibility of any reduction in the price of full finished automobile sheets by the leading sheet manufacturers of the country.

There have been the first signs of a revival in the sheet market, and the volume of business coming into the steel manufacturers is of so diversified a character, including buying by several automotive interests, that it is gaged as the forerunner of extended purchasing within a month.

The refusal of the automobile manufacturers and parts makers to purchase automobile sheets for the first quarter of next year made it appear for a time that the price of 5.35 cents per 100 lb. would of necessity have to be reduced somewhat to attract business to the mills, many of which have practically cleaned up their commitments on automobile business.

There was considerable talk of the readjustment of price to the old differential that existed between the price of black sheets and automobile sheets, which would mean a 5.20 cent price for the latter. However, from recent developments it appears that some automobile interests required material as badly as the mills needed their business, and the result has been apparent in renewed buying, although not on a large scale. Some rush business of this character has been placed here within the past week.

## Fisher Body Corp. Buys Timber Land in South

DETROIT, Dec. 18 — Purchase of about 100,000 acres of standing timber in Tennessee, Arkansas, Louisiana and Mississippi to "insure an uninterrupted flow of raw materials," is announced by the Fisher Body Corp. This acreage will yield, it is estimated, 750,000,000 ft. of lumber.

The properties will be operated by a subsidiary company now being organized under the name of the Fisher-Hurd Lumber Co., of which O. P. Hurd of Memphis will be president.

## Jordan Talks to S. A. E. On Engineering Views

CHICAGO, Dec. 17—Edward S. Jordan, president of the Jordan Motor Car Co., was the speaker before the Mid-West Section of the S. A. E. here Friday night. The speaker said that he wished to correct the announcement of his subject as "What I Know About Engineering" to "What I Know About En-

gineers," as he considered these topics as meaning 'distinctly different things.

"The engineer," said Jordan, "is fundamentally honest, and his opinion is worthy because of that fact. An engineer, if he deserves the title, demands facts and works only on facts, while the salesman and the purchasing departments work with entirely different objectives."

Jordan then told in his personal, semi-humorous manner how the Jordan company was originated and the methods of designing that car. His sole instructions issued to his engineer, he said, were those already made more or less familiar through his public talks: 1, style; 2, comfort; 3, reliability; 4, performance; 5, SERVICE.

At the close of his talk, Jordan offered to answer any questions, and the inquiries put to him were chiefly of a nature that were answered by fact, not opinion.

## INDUSTRIAL NOTES

Wald Manufacturing Co., 1800 Martin avenue, Sheboygan, Wis., manufacturer of automotive equipment, motorcycle and bicycle parts, tire tools, etc., has accepted the proposition of business men of Maysville, Ky., to move its plant and headquarters to that city on Jan. 1. The Wald company is incorporated in Wisconsin for \$90,000 and will re-incorporate in Kentucky with \$125,000 capital to enable it to make proper expansion of plant and production. The Sheboygan factory, containing 32,000 square feet, has been placed on the market.

Wenstone Rubber Co. has placed its factory at Chippewa Falls, Wis., on a eleven-hour daily working schedule. The factory was opened July 5, 1923, when the Wenstone company of Chicago took over the plant built at Chippewa Falls by the old Boone Tire & Rubber Co.

Prime Manufacturing Co., 653 Clinton street, Milwaukee, manufacturer of brass castings for automotive and railroad materials, and for some time engaged also in the production of automobile trunks and luggage, is preparing to erect a large brass foundry and has engaged Frank D. Chase, Inc., Chicago and Los Angeles, to prepare plans and supervise construction and equipment.

Specialty Manufacturing Co., of Rice Lake, Wis., will make and deal in automotive equipment at wholesale. This is a new corporation organized by Christian, Lloyd J. and Ray L. Frederickson. Definite plans are now maturing.

William E. Pratt Manufacturing Co., Joliet, Ill., has reopened one of its furnaces and has now three in operation, turning out malleable castings. An influx of rush orders necessitated the increase in the working units. J. W. Beaman, general superintendent, has added thirty moulders to the force.

Waller Manufacturing Co. of Dubuque, Iowa, which has developed from a concern just emerging from experimental stage in its product in two years to a manufacturing plant, is on the threshold of a \$500,000 business, according to its sales agents, who have been in conference. They brought reviews of the eastern jobbers preparing to handle its nickel-plate, aluminum and brass ware products. The management is planning expansion to meet this new business.

## METAL MARKETS

Steel buying by the automotive industries in the last few days was impressive chiefly because of the contrast it presented with the general aloofness from the market of other classes of steel consumers. Most of the sheet orders were for next month's requirements. It is common gossip in the market that one large consumer was able to obtain a 5.10 cents base price on "run of mill" full-finished automobile sheets, \$5 a ton less than the general quotation on body stock. In justice to the mills adhering to the latter quotation, it should be stated that they have booked and continue to book a fair quota of business. Some buyers happening upon mills that were sorely in need of specifications to carry them over December have been able to shade black and galvanized sheet prices \$2 or \$3 a ton, but this also has been without effect on the market generally.

Most steel consumers are anxious to avoid shipment and billing of material intended for January consumption in December, so as to keep the current year's accounts free from what are really next year's obligations. In the case of some of the smaller mills with blank space in their operating schedules for the year's final fortnight, the buyer who says: "You can ship and bill any time," is naturally welcome. In the aggregate, however, all this business is relatively light.

There is no question that prices generally are firm—for one reason only, that being the determination of the large market factors to hold them so in the absence of all business that might tempt one to make concessions. Alloy steel makers have come in for a very gratifying amount of automotive orders in the last few days. The \$10 per gross ton extra heretofore customary on square billets between 4 x 4 in. and 2½ x 2½ in. has been discarded, and the net ton bar price now applies to billets smaller than 4 x 4 in. This simplifies matters considerably, and quite a few contracts for the next quarter have been closed, most of these accompanied by specifications for January shipments.

Makers of cold-finished bars state that they have completely run out of hot-rolled bars obtained before announcement of the \$3 per ton extra for screw stock and other extras for size, and that continuance of a 3 cents base on their product is only possible if the cost of their raw material is lowered. Prices on hot and cold-rolled strip steel continue to be shaded to some extent, depending entirely upon the attractiveness of specifications, but on the whole concessions are more slight than they were a few weeks ago.

With but little more than a week of the year left, and production during that time interrupted by the Christmas holiday and in some instances by an extension of that holiday, it looks now as though the industry would close the year with one of the heaviest production records in its history, and a relatively light, but at that, sufficient backlog of orders to begin the new year in a cheerful frame of mind.

Pig Iron.—The pig iron market is dormant, and there is no fresh buying by automotive foundries reported. Merchant furnaces are sold against their January-February production, and are now sitting back praying for a buying movement to develop early next year.

Aluminum.—Demand for casting metal from automotive foundries continues at a pace just about matched by the supply. Here and there a small lot of sheets arrives from abroad, but the bulk of the sheet as well as ingot demand must be satisfied by the domestic product.

# Calendar

## SHOWS

- Jan. 5-12 New York, Annual Automobile Show, under the auspices of the National Automobile Chamber of Commerce, Eighth Coast Artillery Armory.
- Jan. 26-Feb. 2—Chicago, Annual Automobile Show, under the auspices of the National Automobile Chamber of Commerce, Coliseum and First Regiment Armory.
- Jan. 26-Feb. 2—Chicago, Annual Automobile Salon, Hotel Drake.
- Feb. 4-9—Chicago, Tenth Annual National Motorcycle, Bicycle and Accessory Show, Broadway Armory, under the auspices of the Motorcycle and Allied Trades Association, A. B. Coffman, secretary.

## FOREIGN SHOWS

- April 2-13—Barcelona, Automobile Exposition, under the auspices of the Confederacion de Camaras Sindi-

- cales Espanolas del Automovilismo y Ciellismo, Palacio de Arte Moderno.
- Aug. 23-Sept. 6—Toronto, Ont., National Automobile Show in conjunction with the Canadian National Exhibition under the sanction of the Canadian Automotive Equipment Association and the Automotive Industries of Canada.

## RACES

- Aug. 3—Lyons, France, European Grand Prix.
- April 27—Trapani, Italy, International Automobile Race.

## CONVENTIONS

- Jan. 5—New York City, Annual Meeting, Automotive Electric Association.
- Jan. 14-18—Chicago, Annual Convention and Show of the American Road Builders' Association, the former to be held in the Congress and the latter in the Coliseum.

- Jan. 30-31—Chicago, Fourth Annual Meeting of the Automotive Electric Service Association, Congress Hotel.

- Jan. 31-Feb. 1—Rochester, N.Y., Winter Sectional meeting of the American Society for Steel Treating, Hotel Seneca. W. H. Eisenman, secretary, 4600 Prospect Avenue, Cleveland.

- May, 1924—Detroit, International Motor Transport Congress under the auspices of the National Automobile Chamber of Commerce.

- June, 1924—Washington, Pan American Highway Congress, under the auspices of the Pan American Highway Mission.

## S. A. E. MEETINGS

- January—Metropolitan Section, No meeting in January.
- January—Mid-West Section, No meeting in January. Mid-

West Section will attend the annual meeting in Detroit in a body.

- Jan. 9—Motorboat Meeting and Luncheon, Hotel Commodore, New York, 10 a.m.

- Jan. 10—Annual Dinner of the S.A.E., Hotel Astor, New York, 6.30 p.m.

- Jan. 17—Indiana Section, Motor Performance, H. D. Horning, Hotel Severin, Indianapolis, 8 p.m. Dinner, 6.30 p.m.

- Jan. 22-25—Annual Meeting of the S. A. E.—Detroit.

- Jan. 23—"The Carnival," Oriole Terrace, Detroit, 9 p.m.

- Feb. 14—Metropolitan Section, Vehicle Depreciation.

- March 13—Metropolitan Section, Replacement Parts and Accessories.

- April 17—Metropolitan Section, Fleet Maintenance, F. W. Winchester.

- May 15—Metropolitan Section, What Roads and Steels Do to Automobiles.

## Ticker Will Quote Prices on Used Cars

(Continued from page 1274)

them at profit. The situation called for selling at once and taking whatever losses were necessary. Appearance of radically changed models on the spring market and the almost certain downward revision in prices by many manufacturers would only entail greater loss. Liquidation at once was the safest course, it was agreed.

The necessity of confidence in each other's appraisals was emphasized by speakers. By checking up among themselves on reasons why sales were lost, presumably through higher appraisals, it could be determined who was right and who was wrong, and whether the salesman was at fault. Only by constant checking up in this way could results be gained, it was declared, appraisal sheets written for periods of months being worthless in the rapidly changing market.

Different methods of handling and paying salesmen were shown in discussion on this point. The placing of men on a salary and commission basis is gaining in the city, and members using it said they were getting better men and better results than they have had before, and were able to work with fewer salesmen.

The speaker of the evening was Lee Force, sales manager of the Reo Detroit branch. He outlined the purposes of the organization. By bringing their ideas together on actual conditions in their own retail field they could profit more, he said, than from any other source. One very specific way in which sales managers could help each other, Force said, was in passing prospects along where for reasons of unchangeable preference for another named make of car, it was impossible to make a sale themselves.

Force outlined the method he was employing managing his sales force and de-

clared every member, when he gets an idea in any way applicable to their work, should pass it along. It was the intention of the organization to get the best ideas of everyone for the use of all. Trade papers have a way of finding out these things and passing them along, he said, and they might just as well be told here in open meeting. Any member who has anything to say and dislikes making speeches should dictate his ideas and read them, or let some one else read them.

## RECEIVER FOR ZWEBELL

MILWAUKEE, WIS., Dec. 17—Zwebell Bros. Co., Schleisigerville, Wis., and Milwaukee, manufacturing vulcanizing machinery, tire equipment and tools and other automotive merchandise, has been placed in the hands of a receiver by the Circuit Court of Washington County, on petition of the Crucible Steel Casting Co. of Milwaukee, which charges the corporation is insolvent. Otto H. Wade-witz has been named receiver. An order has been entered that all claims are to be filed with the court by June 5, 1924.

## PLANT WILL RESUME

EAST MOLINE, ILL., Dec. 17—Spontaneous combustion is believed to have caused the fire which demolished the Aluminum Manufacturing Co. plant in this city with loss of \$10,000. Patterns, valued at thousands of dollars escaped the flames, however, according to Hugo Bloom, manager, who said the plant will be operating again as soon as the factory can be rebuilt.

## MOVING TO AKRON

AKRON, OHIO, Dec. 17—The Standard Parts Co. of Niles, Mich., will occupy the former B. & W. Rubber Co. plant in North Akron immediately after the first of the year. The B. & W. Rubber Co. plant formerly was occupied by the Falor Rubber Co., which went into receivership almost a year ago.

## British Ford Plant to Make 30,000 in '24

DETROIT, Dec. 17—The Manchester plant of the Ford Motor Co. of England, Ltd., the largest automobile factory in the British Isles, has set a schedule of approximately 30,000 cars for production in 1924. This compares with about a similar total for 1923, indicating that the company looks for no falling off in buying in the new year, despite the record totals of the present year.

The British Ford car, which is sold only in England and Scotland and the Ulster province in Ireland, is now 95 per cent British, both in manufacture and materials. When first established, it was dependent on the Ford Motor Co. of America for parts, but with factory expansion this condition has been changed so that the British company is practically a complete producer in itself.

The first plant of the company was in a small factory near London, established in 1910, where 570 cars were built in the first year. It was moved shortly afterward to Manchester, forming the nucleus about which the present plant employing 2200 men has developed. The present plant includes a floor space of 316,920 sq. ft. It is the largest Ford plant outside of the United States.

## HANDLING FISK ABROAD

NEW YORK, Dec. 17—Organization has been announced of the Fisk Tire & Export Co., Inc., to handle foreign sales of the Fisk line of tires and tire products manufactured by the Fisk Tire Co., Inc., of Chicopee Falls, Mass. K. S. Chamberlain, who has been export manager of the company for some time, is president and general manager of the new organization, with Herbert Walmsley as vice-president, and A. C. Walker as secretary and treasurer. Headquarters will be maintained at the present export offices in the Fisk Building.